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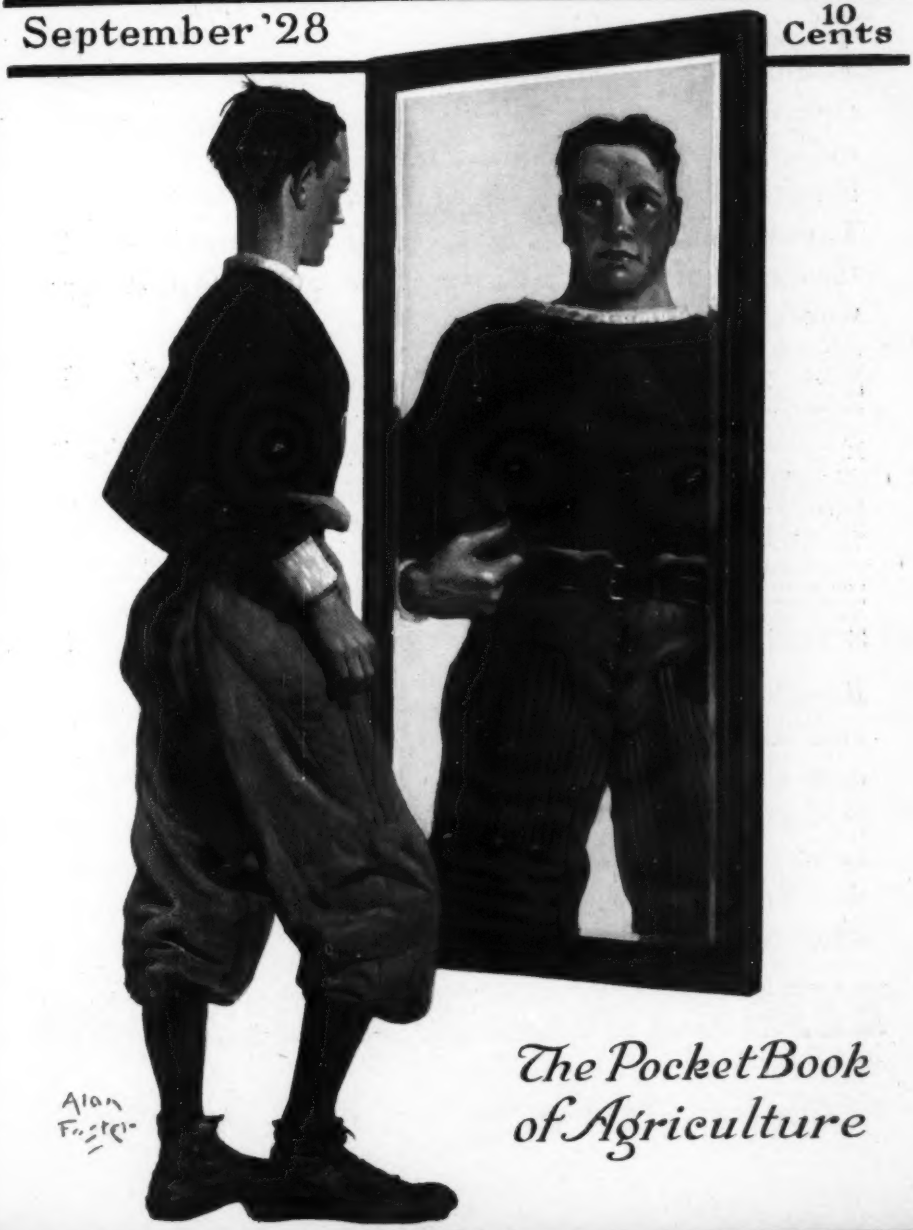

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Better Crops with PLANT FOOD

The Whole Truth—Not Selected Truth

R. H. STINCHFIELD, *Managing Editor* SID NOBLE, *Editor*
Editorial Offices: 19 West 44th Street, New York

VOLUME XI NUMBER THREE

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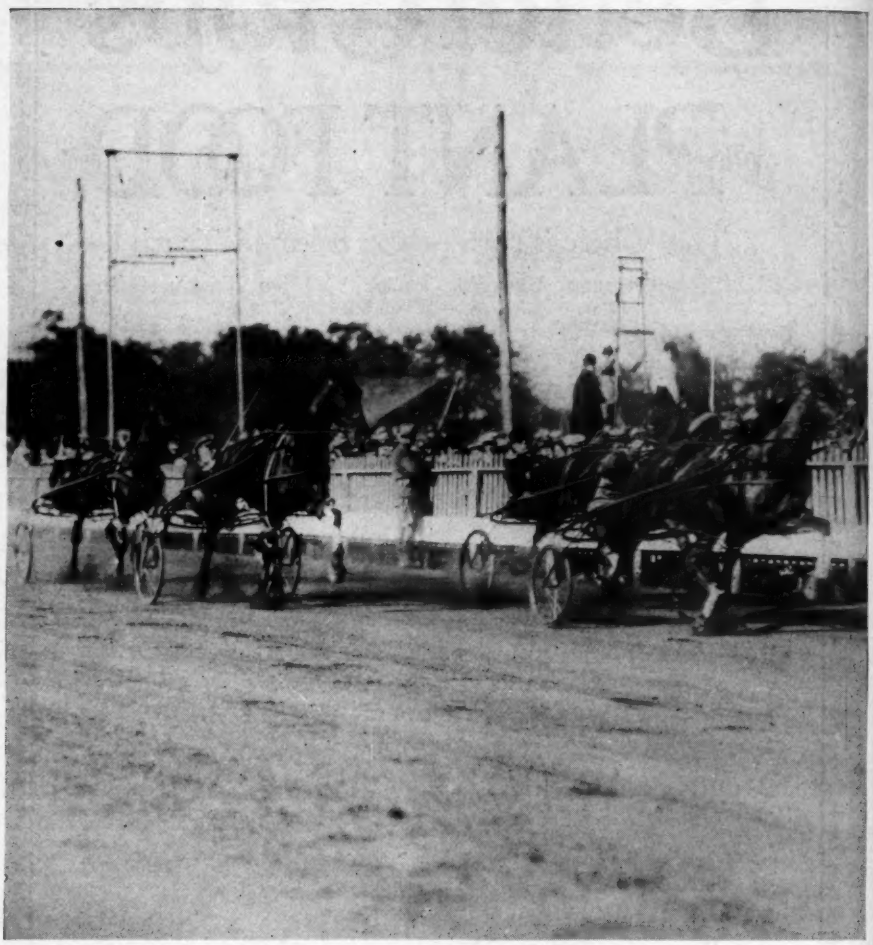

Fall-time is

Fair-time

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Do you mean it when you say, "Sincerely Yours"?

Sincerity

By Jeff McDermid

IN this age of night clubs, time payments, and sliding gear transmission, sincerity is as much to be desired as personal liberty and the gold standard. While I may dissect it, I also defend it, as the surgeon said about the vermiform appendix.

Where does sincerity get its meaning in the limbo of forgotten languages? Sincerity comes from two Greek words, "sine" and "cere," meaning "without wax." Old Grecian pottery makers coined the trade term to guarantee their vases as solid originals instead of broken ones mended with wax. From this early use of a trade guarantee slogan by the Etruscans comes the word selected for the text. Used first as a testimonial of *vase* values, it has remained among the best indicators of *face* values.

"Sincerely yours" has replaced the stiff politeness of Victorian usage when letters were ended with the apostrophe: "I beg to remain, sir, your most humble and obedient servant." Humility and obedience have been cut from correspondence as well as from the wedding rituals. I am not certain, however, that sincerity has always truly replaced those hackneyed phrases in either. In this age of trial marriage and "trying" stenographers, the substitution of "conditionally yours" or "yours with reservations"

might be more sincere after all.

Sincerity is a hard word, an elusive word, a word that is difficult to live up to in my experience. This is perhaps because a scribbler must always have some latitude and license. If writers were obliged to be sincere in all minor details, the jails would be full of journalists. I am not urging more penal accommodations, however.

WE can't always be sincere, it seems, surrounded as we are by others who find it equally irksome and vastly impractical. By this I mean *petty* sincerity as distinguished from broad native honesty. These two degrees of sincerity are as wide apart in practical life as Tex Rickard and the Bishop of York.

Let me illustrate by using my fervid friend, the Senator, whose toga (like the plume of William of Orange) is the "oriflamme of war" and the insignia of reform. In this campaign he is busy with the broadax felling rotten timber, making the chips fly on the stump, and building hog-tight fences with the rails. I have helped him rip off a few shingles myself in former times, and the sawdust is used to dam everything. All honor to his forestry platform, but here is where the saw pinches.

The Senator cannot use more petty sincerity with the voters than I can with Old Bill Jones, my neighbor. Old Bill holds a mortgage on my property, a sort of lien on my lean-to, as it were. If he is looking poorly, I must congratulate him on his health and youthful vigor; if he dresses in outlandish garb, I must overlook it; if his kids trample my lawn, I must expose the "other cheek" in fortitude instead of calling them cheeky.

Oh, how I'd love to be sincere with Old Bill for once! My conversation with him must be the scriptural "yea" and "nay" when he yeas and neighs. Diplomacy and the rule of "confound" interest prescribe my conduct in relation to Old Bill Jones just as the exactitude of practical politics put limitations on the petty sincerity of the belligerent Senator.

The Senator dares not be utterly and frivolously sincere with the proletariat, for if he were to follow such a course unerringly it would put him at a disadvantage and lose him a befuddled following. As I said in a former erudite essay, the politician may use the franking privilege but he cannot always be frank himself and be safe.

But I am not through with the Senator, whose name I shall endorse with a stubby pencil in November. After the dress rehearsal is over and all the cord wood and shavings are collected, my good Senator will return to his desk and roll up his sleeves for some real constructive work. Here is where he may, temporarily, forget petty sincerity and gross insincerity and turn to broad native honesty. He then becomes *our* Senator for six years more of the full dinner pail. He can thereafter forget himself and remember the Maine! But *I* must disregard petty sincerity until we burn the mortgage. Yet I intend to cling to my broad native honesty and inborn nobility each evening after I get the cat kicked out and the doors bolted.

PUT this fact down while we have it wriggling. In personalities as in politics we can stand for petty sincerity of partial truth better than downright insincerity. A man who dare not be foolhardy is wiser than one who "stoops to conquer." I want to tell you why.

To be foolhardy with facts in these complex days is very dangerous. There never was a time when truth itself was more elusive and intangible for the masses. This is because American life is specialized, and there is an awful

(*Turn to Page* 62)

Common barberry growing along the bank of a river n Wisconsin.

The Barberry Battle

By John L. Richardson

U. S. Department of Agriculture

FOR more than 10 years farmers, millers, bankers, and business men, cooperating with the United States Department of Agriculture and other agencies, have been waging an aggressive and extensive battle against common barberry, the shrub which harbors and spreads the destructive stem rust to wheat, oats, barley, rye, and other grains. During this period, more than 16,000,000 barberry bushes have been found and eradicated in the 13 principal grain-growing states of the Northwest—commonly known as the breadbasket of our nation.

A great deal has been said about this campaign, and there are not many people engaged in agricultural work who do not realize that a barberry eradication project is in progress. We find, however, that very few understand the seriousness of the problem and really appreciate the significance of this campaign as it affects the agriculture of this country.

Stem rust is the worst disease of the cereal crops, causing the loss of many million bushels of grain every year. It is a fungous disease which attacks the stems of growing grain, extracting plant food and causing a shriveling of the kernels. This results in a greatly reduced yield and poorer quality of grain. Everyone is familiar with the acute consternation which strikes the hearts of the grain producers when they hear that a serious black stem rust epidemic is expected.

It was 12 years ago when the activities of the common barberry and stem rust first began to alarm the citizens of America. The World War had been in progress two years—it was 1916. The hungry peoples of Europe

were looking to America for enormous supplies of food. Everything indicated that a bountiful crop would be harvested, and the extra millions of bushels of grain needed to feed the hungry world seemed assured. But just before harvest got under way, this arch enemy of the farmer—black stem rust—swooped down on the grain fields of our country and Canada and inflicted tremendous damage.

Nearly 200,000,000 bushels of wheat were lost in the 13 north central states and more than 100,000,000 bushels in Canada, due to that devastating stem rust epidemic of 1916. How severe this blow was to American farmers is indicated by the average loss in South Dakota, which was approximately $800 per farm. Instead of producing an excess of grain to supply the needs of starving Europe, the United States entered the war in April, 1917, with a shortage of flour for the needs of our army.

How was black stem rust, the most dreaded disease in the Northwest—the black scourge of the wheat grower—to be controlled? Farmers were quick to offer a solution. They recommended that the common barberry bush be eradicated in the grain-growing area. It had long been known that rust was worse on grain growing near common barberry bushes, and although the farmers could not explain exactly how the barberry spread the rust, they were convinced that this shrub was responsible for it.

Spring Host to Rust

But how could an innocent-looking barberry bush spread the rust to grains? Scientists proceeded to answer this important question. Black stem rust, as they explained, has three stages in its life cycle, much like the butterfly. It is a fungus, or a tiny plant which lives as a parasite on other plants. One part of its life, the summer stage, is spent on the stems of the grain where it saps the life from the plants and causes the kernels to shrivel; the winter stage is spent on dead grasses and grains; and the spring stage is spent on the leaves of the common barberry plant. Without the barberry bush, the destructive stem rust cannot complete its life cycle in the north central states and the life cycle of the rust is broken, just like breaking a link in a chain. The rust cannot live to complete its development and to attack the grain crops without the barberry.

Applying salt to a large common barberry bush found in an Illinois pasture.

Grain growers and scientists carried their demands for barberry eradication to Congress and other governing bodies. With the sad picture of ruined crops in 1916 still fresh in its memory, Congress rallied to the support of a comprehensive campaign for fighting the stem rust pest with an appropriation for barberry eradication. In accordance with this Act, forces were mobilized under the direc-

tion of the Bureau of Plant Industry within the United States Department of Agriculture and in April, 1918, the great war against common barberry was started. Millers, bankers, and business men also formed an organization known as the Rust Prevention Association, to aid in the fight. This organization has spent $250,000 in assisting the eradication campaign.

Equipped with picks and shovels for use in fighting it, the advance guard of the eradication forces moved forward in 1918 to meet and subdue the destructive barberry. The general opinion was that there would not be much to it—just a skirmish and barberry would be quickly routed. But the recruits found they were battling a foe that had become well intrenched in the prairies and timberlands of the north central and mountain states of the eradication area.

Barberry eradication has moved slowly forward, but it has not been all joy. When the campaign began, it

ABOVE: How to tell the difference between common barberry, which spreads rust, and the harmless Japanese barberry.

LEFT: Sprouting bushes, springing up from old barberry roots.

was thought that the bushes were mostly planted for ornament in cities and towns, with but a few hedges on farms. The earliest survey on farms proved that that idea was all wrong. Less than 3,000,000 million bushes have been found in cities and towns, while more than 12,000,000 million bushes, old and young, have been located in rural districts. The discovery of so many barberries on farms and rural properties was the first outstanding surprise. It was quite obvious that every farm would have to be thoroughly scouted if all the pernicious barberry bushes were to be found.

From where did all these bushes come? Those in cities, towns and villages were planted for ornament. Some of those in the country had been planted for decorative purposes or for hedge fences, but most of them were escaped—running wild.

Barberry bushes produce thousands of berries. Many kinds of birds eat these berries greedily, especially in

winter when other food is scarce and the bright red berries are easily seen. Wherever the birds roost, in groves, orchards, thickets, or woodlands, the seeds have been dropped and seedling bushes have appeared. This has been going on for more than a 100 years in the older states of the barberry eradication area. Millions of seedlings have grown into fruiting bushes which in their turn have started new crops of new bushes. The worst areas of wild or "escaped" bushes, as the eradicators call them, have been found in the rolling and timbered portions of Ohio, Michigan, Illinois, Wisconsin, and certain sections of Iowa and Minnesota. Nearly half a million plants of all ages have been destroyed in one small area of rocky and wooded bluffs along the Mississippi river in Wisconsin. In Lake county, Illinois, which borders Lake Michigan, hundreds of thousands of bushes, large and small, have been removed from exclusive lake front estates in Lake Forest, Waukegan and other cities. On one 60-acre abandoned woodland pasture in Geauga county, Ohio, more than 835,000 barberry bushes of all sizes were found and eradicated during the summer of 1927.

After awakening to the fact that barberry bushes were "running wild," the barberry chasers met with another huge surprise. They were amazed at the long distance rust could apparently spread from one barberry bush and at the tremendous damage for which one bush might be responsible. It has been accurately determined that 92,736,000,000 spores, or rust seeds, may be produced on one average sized bush in one season. If the wind should distribute these spores in a way that one might fall on each square inch of land surface, the spores from this single barberry bush would cover 14,784 acres, or an area of 23 square miles. Anyone familiar with the winds of our prairie states can easily imagine how far the dust-like spores, which are so small that they can be seen only under the microscope, might spread on a windy day.

The spring stage of stem rust, as it appears on the leaves of the common barberry.

Rust Spreads Quickly

It is clearly pointed out that the barberry gives the rust an early start in the spring. Each bush may produce millions of spores, each of which after leaving the barberry and coming in contact with growing grain may produce rust pustules containing from 200,000 to 500,000 new spores every six to ten days throughout the growing season if weather conditions are favorable. Because of the rapid rate of reproductions of the initial infection, a small amount of rust which started directly from one barberry may have increased to tremendous proportions by harvest time.

In 1927, a hedge of heavily rusted barberries was found in Barnes county, North Dakota, from which stem rust infection could easily be traced to fields of durum wheat as far as 10 miles away. Two barberry fieldmen working in Stevens county, Minnesota, noticed that stem rust on oats became heavier as they worked eastward to-

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Cotton variety test at the Stoneville Branch Experiment Station, Stoneville, Miss.

MISSISSIPPI

Experiment Station

By Ben F. Hilbun

Agricultural Editor

BACK in 1883, four years before passage of the Hatch Act by Congress and acceptance of its provisions by the Mississippi Legislature, experimental work was begun at the Mississippi A. & M. College by F. A. Gulley, Professor of Agriculture and Superintendent of the College Farm.

Professor Gulley in a written report dated December 1, 1883, made it clear that the Farm Department was not an "experimental station," but continued his report with:

"We have, however, begun a series of experiments to determine the feeding value of cotton seed and its products, the cheapest and most permanent plan for renewing the fertility of our worn-out lands, the most desirable forage crops for our climate, the grasses best suited to our soils, and the best method of securing stands of same."

Beef cattle on feeding test at Mississippi Central Experiment Station.

The concluding paragraph of this report is doubtless the first and shortest report on experimental work ever made in this state. The conclusions reached were: "We have made ordinary steers gain considerably in live weight on daily rations of cotton seed cooked and hay straw. Several (50) head of dry cows, and calves nearly one year old, have been kept in good condition on an average daily ration of six pounds of seed and six pounds of hay through the winter months, milch cows consuming about 25 per cent more."

Professor Gul-

ley said, "We are nearly ready to commence experiments in the dairy line," and closed his remarks by saying that to carry on experimental work satisfactorily, "special funds, outside the regular college appropriation, are needed."

The needed financial assistance to carry on experiment station work was made possible in 1888 when the Mississippi Legislature accepted provisions of the Hatch Act passed by Congress in 1887.

The work of an experimental nature that had been done for more than four years before the Experiment Station became a reality enabled the first officials to get into a definite program without delay. No funds were available until March 1888, and consequently the work that year was but little more than a continuation of elementary experimentation begun by the Farm Department.

Mississippi being a state of multiform soil types, it became evident that experimental work, if successful, must be carried out in sections of different soil types. The central station, carrying on some investigations that applied to the state as a whole, could not render the needed services along agronomic and soil lines, and the urgent need of branch stations was then recognized.

The first of these branch stations was located at McNeil in 1900, and the initial investigations were with fruits and vegetables. It is generally conceded that this work is responsible for the expansion of trucking and fruit growing now being done on an extensive scale by farmers of that semi-tropical region along the Gulf Coast.

Other Branch Stations

In 1918 the state legislature voted to move the station to Poplarville where better advantages obtained. The old McNeil Station now known as the Coastal Plains Experiment Station was then taken over jointly by the central station and the Bureau of Animal Industry, United States Department of Agriculture, for the purpose of

This photograph of a cotton plot at Poplarville, Mississippi, shows the difference in growth between highly fertilized and unfertilized plants.

conducting investigations along livestock lines, such as feeding steers, utilizing native grown feeds, grading up the native cows of that section by the use of purebred bulls, and making permanent pastures.

The new station established at Poplarville is interested chiefly in horticulture with a great deal of attention being devoted to corn, cotton, and other field crops. Results of experiments with fruits revealed the possibilities for the fruit-growing industry which has grown with such remarkable rapidity in that section.

J. R. Ricks, Director

Holly Springs Branch Station in the hilly section of northeastern Mississippi and the Stoneville Branch Station located in the alluvial lands of the Yazoo-Mississippi Delta were established by legislature enactment in 1904. Raymond Branch Station, located in the southwestern part of the state, was established in 1920, being the youngest of the auxiliary experiment stations.

The Legislature of 1928 made liberal appropriations for the expansion of the central and branch stations with a large fund for the extension of the Delta Branch Station at Stoneville. Another unit to the system has been organized in Adams county, the work to be done there to be wholly with pecans.

Delfos Cotton Developed

Several projects in agronomy are under way at the present time. Some of them are: the effects of certain crops on soil fertility, forage crops, permanent and temporary pastures, cultural methods of cotton and corn, various forms and combinations of nitrogen, phosphorus, and potash for cotton and corn, different crops for silage, cotton wilt test, corn and cotton variety tests, and plant breeding work with cotton and corn.

Plant breeding work includes the production of improved varieties of cotton and corn. Tests are run comparing the merits of the many commercial varieties currently available. Fifty to seventy-five varieties of cotton and fifteen to twenty varieties of corn are compared annually.

Probably the greatest single achieve-

Soybean experiments are carried on at all of the Mississippi stations.

The agricultural building at the Mississippi A. and M. College.

ment of the Mississippi Experiment Stations was the development of Delfos cotton, a long staple variety particularly adaptable to the fertile delta lands.

Production in that section had been badly impaired because of the ravages of the boll-weevil, and it was decided that to alleviate the conditions of the delta planters it would be necessary to breed up an early variety of long staple cotton. Dr. H. H. Brown attached to the central station, was assigned this task, and the Delfos cotton was produced.

According to planters who have been using Delfos cotton since it was first introduced, it redeemed the cotton industry in the delta. It is estimated that the increased yields of this variety over others in the delta means an increase in returns of more than $1,000,000 annually. Being early maturing, the crop is pretty well made before the boll-weevil infestation becomes extremely hazardous, and the length of the staple insures top prices.

At the present time 95 per cent of the cotton planted in the Mississippi Delta is Delfos. It is also being used more extensively each year in other parts of the delta. Notwithstanding its adaptability to alluvial lands, it is grown more extensively each year in the hill section of the state, where it is proving satisfactory.

Plant breeding work is also being done with short staple varieties of cotton. Improvements are constantly being made in the popular varieties being grown in the state.

Other projects include breeding and variety tests with oats and soybeans, soybean oil studies, winter cover crops, and soybeans for feeding and soil building.

The central station has conducted a number of fertilizer experiments in the Northeast Mississippi Prairie belt, Hills and Flat Woods of East Central Mississippi, and in Choctaw county where the soil is of a sandy clay type commonly found in the Short-leaf Pine area of the state. Fifteen trials, three-year average, were made in Choctaw county tests, 68 in the Hill and Flat Woods tests which ran over a period of three years, and 16 trials in the Prairie over a two-year period.

Fertilizer Tests

Results of varying amounts of phosphoric acid, nitrogen, and potash used in the Choctaw county tests showed that an 8-6-4 was the best

fertilizer mixture to use, a net profit of $48.31 being realized on an acre from the use of 600 pounds of this combination. In the Hills and Flat Woods this mixture again showed the highest net profit per acre, the amount being $29.50. More nitrogen gave better results in the Prairie section, an 8-8-4 leading with a net profit of $22.82, followed by a net profit of $18.92 obtained from the use of 600 pounds of an 8-6-4 fertilizer.

To determine the most profitable amount of fertilizer to use, varying amounts were tried in each of the 84 tests completed. An 8-4-4 combination was used in each instance. In Choctaw county 600 pounds gave a net profit of $32.52; 1,200 pounds, a profit of $49.95; 1,800 pounds, a profit of $57.74; and 2,400 pounds, a net profit of $55.73.

All Hill and Flat Wood tests gave the following results: 600 pounds, $24.14 net profit; 1,200 pounds, $33.64; 1,800 pounds, $33.87; and 2,400 pounds, $29.71 net profit. Profitable results were obtained by increasing amounts in the Prairie section as 600 pounds netted $11.49; 1,200 pounds, $19.89; 1,800 pounds, $20.61; and 2,400 pounds, $19.64.

The most profitable amount in each case, as indicated, is 1,200 to 1,800 pounds per acre. On an average, 2,400 pounds was more profitable than 600 pounds, as the former amount failed to produce a net profit in only a few cases. The above amounts, as stated, were based on the use of an 8-4-4 fertilizer, but results indicate that a smaller amount of an 8-6-4 would have given as good returns.

B. M. Walker, Ph.D., President, Mississippi A. and M. College.

For years, wilt and rust, prevalent cotton diseases, exacted heavy tolls from the cotton crop in Mississippi, materially reducing production and incidentally affecting the quality of cotton produced. Mr. E. B. Ferris, director of the Poplarville Branch Station, believing that a lack of some form of plant food in the soil caused these diseases, started investigations in 1919 to determine the source of wilt and rust infection and find effective control measures.

Plot in foreground without potash for eight years was 90 per cent wilted. Plot in background with potash had practically no wilt.

This work was inaugurated with one acre of land divided into 12 plots and fertilized in 8 different ways, using four plots as checks. The land was planted two years to sweet potatoes, one to corn, and since 1922 has been planted to cotton continuously. Each plot has received the same plant food every year, 1928 being the tenth successive year this has been done. No very marked differences were shown at first between the plots with and without potash in the mixtures, but as the experiment was continued the plots without potash began to develop wilt which has become so bad in recent years as to practically destroy stands before the end of the growing season. On the other hand, all plots with potash have remained free from wilt at least until very recently and then it appears progressively as the minimum of potash has been used.

In 1919 Mr. Ferris set aside 56 plots of land for general work with fertilizers for cotton. At first the plots without potash showed no marked difference from those receiving phosphorus and nitrogen alone, but as the experiments were continued on the same plots, rust became so bad on those where potash was absent that by midsummer of each year all leaves were shed on the no-potash plots while those with potash remained green until frost. As far back as 1922, after the experiments were begun, the addition of potash to phosphorus and nitrogen gave splendid increases in yields. A combination of 240 lbs. superphosphate and 240 lbs. cottonseed meal yielded 810 lbs. seed cotton while the supplement of 240 lbs. kainit to this mixture gave a yield of 1,332 lbs. seed cotton per acre. "To the eye the difference was even greater than the above figures would indicate," said Mr. Ferris.

Enlarge on Work

The 56 plots in general fertilizer tests were taken out of cotton in 1925 and planted to corn for two years. No potash was used in the fertilizer combination for corn. Dr. D. C. Neal, plant pathologist, A. and M. College, cooperating with Mr. Ferris in rust and wilt control measures, assisted in planning a series of experiments with those 56 plots in 1927 which were again planted to cotton. The plots were fertilized in different ways, using 600 pounds per acre of an 8-6-0 on checks and 600 pounds per acre of an 8-6-8 from four sources on the plots receiving potash. The average increase in yield of seed cotton per acre from the four sources was 382 pounds over and above the average of the plots that did not receive any potash. Since there were four replications with each source, or 16 replications in all, the results were significant in showing the effect of potash in the control of rust. Mr. Ferris states that one could have told the difference in the plots with and without potash in the fertilizer mixture if he had flown over the field in an aeroplane, so great was the contrast.

Results of experiments dealing with rust and wilt control were so important that this year (1928) finds the station force enlarging upon the work begun some 10 years ago. An increased number of experimental plots are being used on land leased for the purpose of expanding fertilizer investigations. Experiments now being run looking to better control of rust and wilt in cotton are:

The use of animal manures in connection with commercial fertilizers containing varying amounts of potash from several sources;

The turning under of a number of winter cover crops now being followed by cotton fertilized in several different ways and grown on limed and unlimed land;

The use of fertilizers with varying amounts of potash, ranging from an 8-6-0 in 2 per cent increases to an 8-6-14, all applied before planting;

Similar work to the above using 800 pounds of an 8-6-4 mixture uni-

(*Turn to Page* 57)

LEFT: The field is in perfect condition for planting after one time through with the "pulverator plow."

RIGHT: The revolving blades seen at the right of each plow share pulverize the soil as it is turned up.

The Plow *that* Pulverizes

By William D. Bowie

Ames, Iowa

THE "pulverator plow," an implement which does the operations of plowing, disking, and harrowing all at one time, recently has been perfected by J. B. Davidson and E. V. Collins of the agricultural engineering department, Iowa State College.

The invention consists of 10-inch blades set along a rapidly revolving vertical shaft beside each plow share. The blades catch the soil as it is thrown up from the share and pulverize it, distributing it evenly in the furrow. The blades are turned by a power take-off shaft from the engine of the tractor pulling the plow.

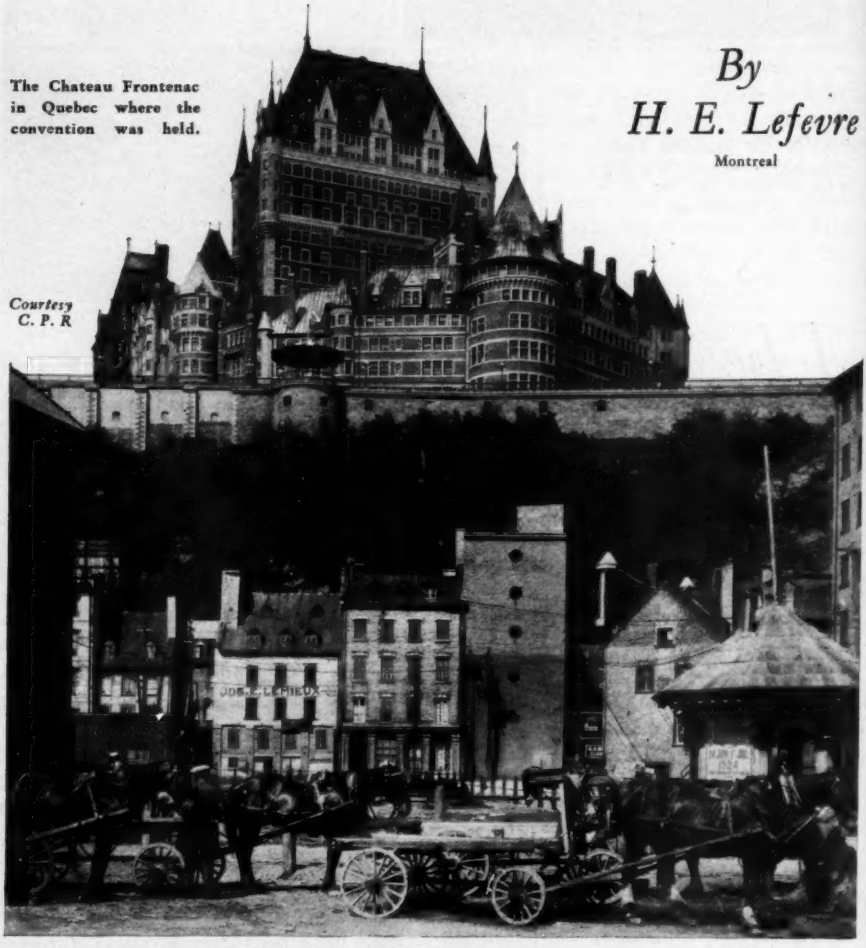
The new implement takes only 10 to 15 per cent more power than a regular plow, according to Mr. Davidson. This is because the new plow makes more efficient use of the power developed by the motor of the tractor.

The blades, which turn at the rate of 525 revolutions per minute, break up all clods and fill the furrows, leaving a level surface appearing like freshly-harrowed ground. Cornstalks and stubble are broken up and well covered. No air spaces are left below the surface of the ground, as with the old-type plow, to hinder the downward growth of roots, Mr. Davidson asserts.

Experiments with plows of this kind have been carried on in different parts of the country. Mr. Davidson, with the assistance of E. V. Collins, has been working for three years to perfect the new implement. Sixteen experimental plows were constructed before the final plans were worked out for the implement which is now being manufactured.

The Quebec Convention *of the* Canadian Agriculturists

By
H. E. Lefevre
Montreal



The Chateau Frontenac in Quebec where the convention was held.

Courtesy C. P. R

ON June 11 there opened in Quebec a convention that is to live in the memories of all present as a very delightful event and a masterpiece of organization. A pleasant affair, well planned and well managed, the convention proved interesting in so many respects that none left Quebec without regret that it was over.

The Canadian Society of Technical Agriculturists, more commonly known throughout the Dominion by its initials, "C. S. T. A.," was organized at Ottawa in June 1920, for the purpose of bringing together men engaged in all phases of agricultural work

throughout the Dominion. Judging by its last convention, the Society certainly succeeded in developing among them the best spirit of understanding and cooperation.

The C. S. T. A., which is affiliated with the American Association for the Advancement of Science, the Royal Society of Canada, the British Association for the Advancement of Science, the World Agricultural Society, etc., publishes a monthly review printed in English and in French: "Scientific Agriculture (La Revue Agronomique Canadienne)." Years of effort on the part of its editors have put this review up to the standard of the best scientific publications.

Courtesy C. P. R.

A street market in Quebec.

The Society is divided into 17 local sections, one section at least being in existence in every province. Each section has its own organization and meetings.

The Society holds a general meeting every year, alternately in Eastern and Western Canada. Previous meetings had been held at Winnipeg, Manitoba; MacDonald College, Quebec; the University of Saskatchewan; the Ontario Agricultural College; the University of Alberta; Ottawa, Ontario; Vancouver and Victoria, B. C. For the first time the convention this year was held in the heart of French-speaking Canada.

On this subject of languages, the convention almost offered a slightly humorous spectacle. To an unprejudiced and somewhat simple mind, a few lectures and toasts would have made it quite plain that Canadians belonged to either one of two main groups: (a) Those who were making speeches in French, known in handbooks on geographical and ethnological subjects as English-speaking Canadians, and (b) Those who were making speeches in English. They were the very men whom the same handbooks classify as French Can-

Courtesy C. P. R.

An interesting old street, Quebec.

Mr. E. S. Archibald, President-elect.

adians. (It would not be fair for the writer to steal Major Strange's remarks about those speaking "Parisian French.")

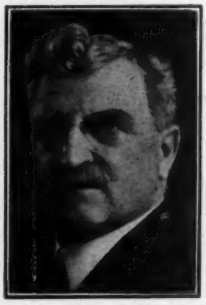
Leaving all jokes aside, the feelings of understanding and friendship that during the convention were so obvious between the representatives of the two races that built Canada, are a very good omen for the future of the Dominion.

Quebec had more than one claim to be the seat of the convention. It is the oldest city on the American Continent, having been founded by Champlain in 1608. Louis Hebert, a colonist who came from France, who was the first Canadian farmer, had his farm inside the limits of the present city of Quebec. There is a monument to Louis Hebert in Quebec, probably the only monument ever erected to a "mere" farmer. Laval University, founded in 1852, was the first Canadian university and always one of the most eager to promote agricultural education. The affiliated school of agriculture at Sainte-Anne-de-la-Pocatiere was the first agricultural school in Canada.

Mr. J. P. Sackville, Vice President.

Mr. L. H. Newman, Honorary Secretary.

Quebec today is a delightful city, combining the efficient organization of an up-to-date city, provided with all modern facilities, with the charm of old streets that still remember the glory of the old French flag, white with "fleurs de lys" of gold, forgotten even in France today. The Chauteau Frontenac, one of the best Canadian Pacific Railway hotels, used as headquarters by the convention, commands a magnificent view over the valleys of the Saint Lawrence and Saint Charles Rivers. Last, but not least, the delightful hospitality of the population of Quebec made it an ideal place to come and meet old friends and acquaintances and chat merrily of everything under the sun.

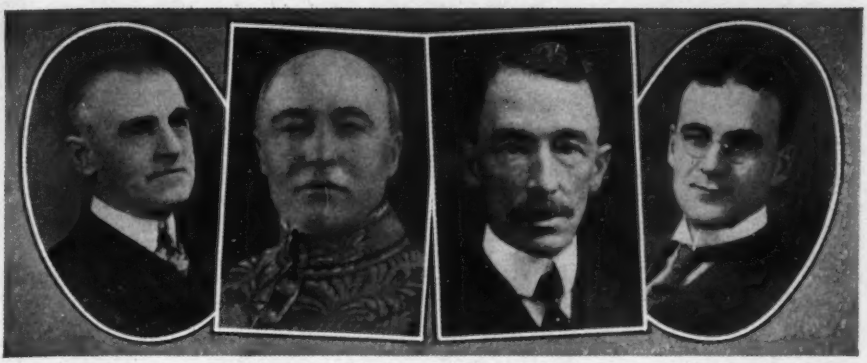


Dr. A. T. Charron, Vice President.

The convention was attended by more than 300 members of the Society. It opened on June 11 with a statement of the results of the election of the Society's new bureau. The new president is Mr. E. S. Archibald, Director of the Dominion Experimental Farms; the new vice-presidents: Mr. J. E. Sackville, Professor of Animal Husbandry at the University of Alberta and Dr. A. T. Charron, Assistant Deputy Minister of Agriculture of the Dominion; the honorary secretary, Mr. L. H. Newman, Dominion Cerealist. The general secretary is Mr. Fred H. Grindley who has been general secretary since 1920.

Mr. Fred H. Grindley, General Secretary.

At the luncheon the delegates were welcomed to Quebec by Dr. P. H. Bedard speaking in the name of His Hon. Mayor Auger. Before and after the luncheon, lectures were delivered in



Hon. J. Ed. Caron, Minister of Agriculture. | His Honor Narcisse Perodeau, Lieutenant-Governor. | Hon. L. A. Taschereau, Prime Minister. | Mr. J. A. Grenier, Dep. Minister of Agriculture.

English or in French (sometimes in both languages at the same time), in the Promotion Hall of Laval University, by Dr. A. Volkhart, Director of the Oerlikon, Switzerland, Experimental Station; Mr. H. M. Nagant, Professor at the Institut Agricole d'Oka; Dr. Lattimer, Professor at MacDonald College; and Dr. J. D. Black, Professor at Harvard University.

Mgr. A. E. Gosselin, Rector of Laval University, took the occasion of the convention to confer the honorary degree of D. Sc. A. upon three ex-presidents of the Society; Dean E. A. Howes of the University of Alberta, Dean H. Barton of MacDonald College, and Mr. L. P. Roy of the Quebec Department of Agriculture. This proved to be one of the most stirring moments of the whole convention. All three new doctors were enthusiastically applauded and warmly congratulated by their friends, which is to say, by every member of the Society.

Renewed appreciation of the honor conferred on him was given Dr. Roy that same evening at the business banquet during which, being the last president in charge, he delivered an address. Dr. Roy appeared to be and certainly deserves to be the most popular member of the Society. Other reports were presented by Mr. F. H. Grindley, general secretary, who, although he received no honorary degree, was also warmly cheered by the members of the Society and deserved it; by Mr. L. H. Newman; and Mr. G. E. McRostie.

L. Ph. Roy, Ex-President.

Rev. A. E. Gosselin, Rector, Laval University.

On Tuesday, June 12, a trip was made from Quebec to the School of Agriculture at Ste-Anne-de-la-Pocatiere. Four hundred and ten visitors were received by M. l'abbe Noel Pelletier, Director of the School of Agriculture. A visit was then paid to the experimental farm where Mr. J. A. Ste-Marie, Manager, explained to the visitors the work done by the station.

In the evening a banquet was served in the Classical College at Ste-Anne-de-la-Pocatiere. Mgr. A. Boulet welcomed the visitors and at the end of the banquet Mgr. Wilfred Lebon, principal of the College, thanked them for the visit paid to the College. Addresses were delivered by M. l'abbe Jean, Professor at

Mr. H. Barton,
Dean of Macdonald College, P. Q.

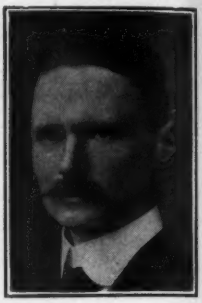
Ste-Anne and President of the local section of the C. S. T. A.; by Mr. Archibald; and Dr. John Black.

This trip to Ste-Anne-de-la-Pocatiere was one of the most pleasant features of the convention. The cars passed through, in an interesting section of the Province of Quebec, some of the oldest settlements on the American Continent. The beautiful weather gave their fullest picturesque effect to the mighty St. Lawrence River and distant Laurentian Mountains. Special mention must be made of the remarkable organization of the trip. Eighty-eight cars carried the visitors from Quebec to Ste-Anne and back, a round trip of more than 150 miles. Motorcycles opened the way; a car with mechanics equipped to take care of any necessary repairs followed the motorists. Everyone was transported safely and on time. Even the few inevitable "flats" did not succeed in dampening the good humor of the party. Mr. N. Savoie, of the Quebec Department of Agriculture, who was in charge of the trip, certainly ought to be congratulated.

The writer feels that something ought to be said also about the dinner at which simply and deliciously prepared food was served a-plenty; he still thinks the Ste-Anne strawberry jam is not to be equalled anywhere.

Abbe Noel Pelletier,
Director, Ste. Anne de la Pocatiere.

On Wednesday, June 13, a trip was made to the Experimental Station at Cap Rouge where the party was in charge of Dr. Gus. Langelier, Manager of the station. Lunch was served on the lawns of the station where the good weather and pleasant company put everybody in the best of moods. In fact the lawns were so comfortable that the writer must humbly confess that he will have to go back to Cap Rouge to know something of the work carried out by the station.



Professor H. M. Nagant,
Oka Agricultural Institute.

On the way back to Quebec the party stopped at the Quebec bridge, a gigantic structure boldly thrown over the St. Lawrence river. An elderly lady came walking by (she, of course, did not belong to the convention) and was heard to inquire sweetly of her escort, "It's a *genuine* steel bridge all the way through, isn't it?"

At the morning session of the Society H. M. Nagant, Professor of Geology and Chemistry at the Oka Agriculture College, University of Montreal, had been chosen as the most outstanding and valuable member of the C. S. T. A., and unanimously awarded the Fellowship prize. No better choice could have been made than that of Prof. Nagant, who is not only a distinguished scientist, but the kindest of men.

In the evening a banquet, offered by the Quebec Department of Agriculture at the Chateau Frontenac, was presided over by the Hon. J. A. Caron, Minister of Agriculture of the Province. Fol-

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Mr. E. A. Howes,
Dean,
University of Alberta.

Here's Our Old Friend Again—

Supply and Demand

By Arthur P. Chew

U. S. Department of Agriculture

"DO you still believe in supply and demand?" said a western newspaper editor to me not long ago, when I suggested to him that blaming grain exchanges for low prices was like blaming the barometer for bad weather. "In this part of the country we've dropped that superstition. Supply and demand may have worked in the old days of really free competition. It doesn't work now that all the channels of money and trade are in the hands of monopolists who can fix prices to suit themselves. When the grain markets drop five cents a bushel, it is not because the supply and demand ratio has changed, but because a few operators have decided the farmers are due for a trimming. It is the same with cattle and hogs and with cotton. These commodities are all under the control of groups that have repealed the law of supply and demand, and have substituted for it their own arbitrary will."

That sort of an opinion can only be refuted with facts, and at the time I did not have the right facts at my command. The other day, however, I had the pleasure of mailing to my editor friend a copy of a study just completed by the United States Department of Agriculture on cotton prices, which shows that the cotton market in the last 30 years has been governed, not by speculation or by monopolies or by misleading reports, but by our old friend supply and demand. This study is based on statistical data indicating how the various supply and demand factors fluctuated during the test period. It demonstrates, by the conclusive test of experience, that prices never stay very long either above or below the natural supply and demand level. If he respects the logic of facts, my editor will be forced to admit that he was wrong.

How Price is Determined

But the belief that the law of supply and demand does not work any more is exceedingly widespread. That is shown by the recent uproar regarding the issuance of market forecasts by the United States Department of Agriculture. No such uproar could have arisen had the opinion not prevailed that market prices are influenced by opinions rather than by the basic facts of supply and demand. When the Senate recently passed a bill fixing a penalty of $15,000 fine or five years imprisonment for Government officials who publish or authorize the publication of forecasts as to the price of cotton, it testified to a conviction that other forces more powerful than the law of supply and demand can and do enter the commodity markets. It may therefore be worth while to glance at the evidence on which the Department of Agriculture bases its assertion that the

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"Nothing But No. 1's" —*the* PECANWAY *Aim*

By Sid Noble

"WE have been successful in the pecan business because we try to produce nothing but No. 1 nuts," said M. O. Dantzler to the writer on the occasion of a recent visit to Pecanway Place, at Orangeburg, South Carolina, generally recognized as one of the most successful pecan farms in the South. "We treat our trees well and they are good to us.

"In 1926 our 45-acre orchard produced 42,000 pounds of pecans, 38,000 pounds of which sold as No. 1 nuts," he continued. "We graded 12,000 pounds of these as Pecanway No. 1 nuts and sold them through the mail at more than $1.00 per pound. We sold 24,000 pounds through the Carolina Co-ops 21,000 pounds of which graded United States Standard No. 1, and the remainder was sold in bulk to buyers in Cleveland, Ohio, at No. 1 prices."

The Pecanway No. 1 pecans that Mr. Dantzler speaks of are very high-grade nuts, and are sold with the aid of national advertising to buyers throughout the country. They are

Ten-year-old pecan trees and a second-year growth of crimson clover.

carefully picked and graded, and made up into packages. A three-pound package sells for $3.50 east of the Mississippi, and $4.00 west of the Mississippi. A five-pound package sells for $5.50 and $6.00.

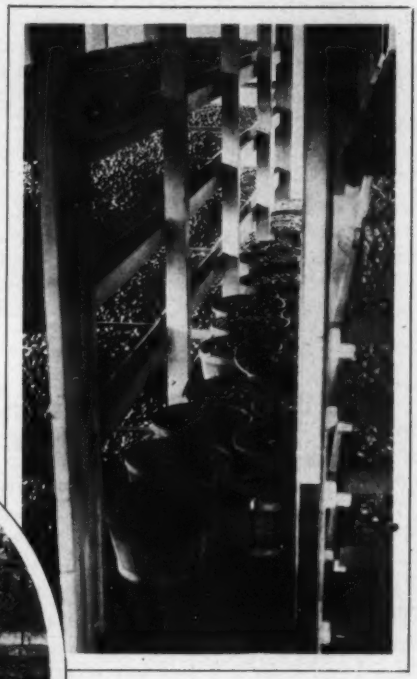
"We try to grow pecans that are better than the best that the other growers produce," Mr. Dantzler said. "Our success in this respect is proven by the fact that our Pecanway No. 1 grade is much higher than the generally accepted No. 1 grade. As a result, our packages are much in demand, and each year we have to send back many orders which we cannot fill. One year we were forced to return $8,000 in checks because we did not have enough Pecanway No. 1 nuts to supply the orders."

Cradled in Courage

Pecanway Place was begun 28 years ago by Mr. Dantzler's father. Convinced that the generally accepted idea of an "every-other-year-crop" of pecans could be overcome by proper fertilization, he purchased 100 acres of very sandy soil, and set out to make a successful pecan farm. He suffered set-back after set-back in the early years of his venture. However, he was never discouraged, and the fine grove at Pecanway today is silent proof of the fact that he had the courage of his convictions.

His first discouragement came when he purchased his first trees. After building up his soil by planting the first velvet beans in South Carolina, he set out 30 acres in pecans at the rate of 20 trees per acre. He afterwards found that the trees which he had bought for budded trees were seedlings, and they all had to be dug up. Through a lawsuit he succeeded in getting his money back, and replanted this orchard with budded trees, in the meantime keeping the remainder of his farm in corn and velvet beans.

These trees brought him a second discouragement by scabbing severely as soon as they came into bearing in 1908. He called on the government for help, and specialists were sent to his farm in 1909 to experiment in the control of the scab. By 1911 they



ABOVE: Drying racks in the grading and packing shed.

LEFT: The cover crop is important.

had found it impossible to control this scab in the trees which were of the Texas Prolific and Sansaba varieties.

That same year, the trees were cut back and top-worked to 14 varieties in an effort to find the best pecan trees for his particular conditions. When the trees came into bearing in 1914, the Schley was chosen as the best nut of the lot. At about this time he added another 15 acres to his grove, and it has never been increased beyond this size.

Mr. Dantzler is convinced that it is useless to plant pecan trees unless they can be well taken care of. He deems it inadvisable for any farmer to plant pecan trees unless he is in a position to give them the best possible attention and treatment.

Better Than the Best

All of this time, the trees were being given a complete fertilizer high in nitrogen and potash at the rate of 30 pounds per tree. In 1915 a system of clean cultivation in the summer and a winter cover crop was started.

The grove yielded the first crop "that amounted to anything" in 1917. That year, Mr. Dantzler, Sr., started to try by better methods of fertilization to produce a better nut than that produced by other growers, and conceived the idea of selling in small packages at a premium through national advertising. This idea met with almost immediate success, and today from 6,000 to 12,000 pounds of Pecanway No. 1 nuts are sold each year in small packages. The amount depends upon the crop. All of the nuts that can be produced which will come within the high standard of the Pecanway No. 1 grade are easily sold in this fashion.

The business grew year by year with 1926 as the banner year:

1919.....	16,000	pounds
1920.....	8,000	"
1921.....	19,000	"
1922.....	12,000	"
1923.....	16,000	"
1924.....	22,000	pounds
1925.....	1,800	"
1926.....	42,000	"
1927.....	13,000	"

(In 1925 a beautiful crop was set but dry weather completely ruined it.)

By comparing the yields with the fertilizer applied, it can be seen how the yields came up as the fertilizer came up, and the yield remained fairly steady year after year, thus insuring a good crop and doing away with the "every-other-year-crop" idea.

In 1923, 1924, and 1925, 400 pounds of sulphate of ammonia were broadcast in August, and 40 pounds per tree of 10-5-8 fertilizer were applied in April. In 1926, 40 pounds per tree of 13-3-20 were applied in April. In January, 1927, 500 pounds of superphosphate and one ton of lime were broadcast, followed by an application of 40 pounds per tree of a 2-8-16 in April. In April, 1928, a 7-9-10 fertilizer was broadcast at the rate of 1,200 pounds per acre.

Filling the Shell

"When we decided to put out package nuts, we needed both size and quality to make this idea a success," Mr. Dantzler said. "Therefore, we were careful to use a complete fertilizer high in potash to produce quality. We found by experiment that potash produced a better flavored nut higher in oil content and richness. It was then we adopted the slogan. 'Our nuts burn like a candle.' In order to maintain this high standard, we must completely fill the shell. I have found nuts popping open on trees that received extra high applications of potash, the potash so completely filling the shell that the shell was not large enough for the kernel.

"We now have 570 trees on 45 acres. My father turned the orchard over to me in 1924, two years before he died, and I have continually endeavored to maintain the high standard of production that was his aim."

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Making wheat hybrids to produce smut-proof wheats.

Wheat Breeding

By E. N. Bressman

Oregon Agricultural College

A RECENT survey by J. A. Clark of the United States Department of Agriculture shows that up to the present time we are indebted to the grower or farmer for a majority of the varieties that we are now growing. There is a change coming about, however, and most of our new varieties are being originated by professional plant breeders connected with the various state agricultural experiment stations and the United States Department of Agriculture.

The professional plant breeder has an enormous advantage over the grain grower in developing new material. He has more time, more funds, and without a doubt a better scientific background for carrying on the work. In at least half of the states of the Union and in every state where wheat is an important crop, there is being carried on some type of a program to develop new and better varieties. In fact, there is so much work being done that it requires constant effort to keep up with the varieties being developed.

There are many improvements that are being worked upon. In every case, the increased yield per acre is an important item. However, it is not the only factor as many characteristics of the plant such as disease resistance, winter hardiness, non-lodging, and improved quality are receiving recognition. More than likely resistance to disease is receiving more attention than any other factor. The two most important diseases of wheat are rust and smut.

Plant breeders are using three general methods of attacking the problem of developing improved varieties. These three methods are known as the

introduction, selection, and hybrid method of improvement. Many are of the opinion that wheat breeding means the making of hybrids between various plants. This, however, is only one method of attack although it is an important one and is receiving more and more consideration. It may be well worth while to discuss these three methods and tell not only how they are carried out, but give some of the interesting developments made along each line.

Introductions of wheat varieties are made not only into this country from foreign ones, but also from state to state. It is no small task to test out all of the known wheat varieties and decide upon their ability under any particular environmental condition. This is the first thing that should be done, however, in a wheat-breeding program, so that the worker may know where to begin. Also, because of the many originations made each year, it is necessary to carry on this work constantly and test the new material being developed. The common method of growing a large number of introduced varieties is to put them in rows a rod long in what is known as the breeding nursery. Usually three of these rod rows, one foot apart, are grown as a plot, and three plots are usually included to get a fairly accurate idea of their ability.

Many of our standard varieties of wheat are introductions from foreign countries. The most notable, without a doubt, are Turkey, the famous hard red winter wheat; Marquis, the well-known hard red spring wheat; and Federation, the new white spring wheat from Australia which is doing so well in the Western states. The introductions of valuable wheat varieties from one state to the other are almost without number, and nearly every state is growing a variety of some value that has been originated in another state.

The oldest and perhaps the best known method of improvement in both plants and animals is selection. Everyone is familiar with the plan of selecting the best individuals to propagate. This method has long been used with wheat and is extremely valuable. It is still being used in many places and the results are outstanding. The most valuable wheat selection probably is Kanred, the hard red winter wheat selected from the old variety Turkey at the Kansas Experiment Station. This variety is resistant to many forms of rust and is being grown as a leading variety in several of the larger wheat producing states. Many other selections such as Red Rock in Michigan and Regal and Oro in Oregon are adding to the profits of the wheat grower.

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Rows and small plots of grain, Experimental Farm, Ottawa, Canada.

Quality Production PAYS

By Robert Stewart

Dean, Nevada College of Agriculture

MASS production in industry, whereby the output of the individual worker has been markedly increased, has led to the realization of the entirely new principle that human wants and desires are not limited but that the consuming public wants more of the better things of life. The demand for commodities which have quality and style is always unsatisfied. This principle is now the lodestone of industry.

While the capacity of the human stomach for food is limited, the demand for quality foods is unlimited, and the new guiding principle of industry is equally adapted to agricultural production. The old practice of blind production in agriculture must give way to quality production. The farmer must produce these commodities which the consuming public wants and for which it is willing to pay. Many farmers are aware of this principle and are making good profits, while others are producing blindly in the hope that they may have a lucky break.

The application of this principle to agricultural production is well illustrated by the results obtained from the olive orchard owned by the writer. This orchard is part of a tract operated by the Berkeley Olive association consisting of 442.68 acres of the Mission variety of olives near Oroville, California. This association consists of 24 individual members, each of whom owns and controls a definite area of land. The individual tracts vary in size from nine acres to forty-nine acres. The irrigation, pruning, and cultivation are uniform over the whole area and are done as though the grove was all in one orchard. The individual tracts are fertilized, however, in accordance with the varying conceptions of the several owners. Consequently, some tracts do not receive any fertilization at all, some receive sheep manure, while others receive commercial fertilizer of various kinds.

The Mission variety of olives is of value for pickles and oil production. The price paid for the pickles is based upon the size of the olives. The olives accordingly are graded into five sizes, mammoth, extra large, large, medium, and oil olives. The mammoth size is worth $230 per ton, the extra large $175 per ton, the large size $135 per ton, the medium size $75 per ton, while the oil olives are worth only $50 per ton. The profits in olive production, therefore, are determined by the relative proportion of the larger size of olives.

Use Fertilizers

The writer's tract of nine acres has received commercial fertilizer for the past four years. The effect of this treatment has been most pronounced, not only in the increased yield obtained but also in the quality of the fruit obtained and the price received for it.

The yield of olives from the entire 442.68 acres of olives in 1927 was 579 tons or 1.3 tons per acre. There were 361.25 tons of pickles and 175.-75 tons of oil olives, i. e. 62 per cent of the olives were pickles. This was a good record and was better than that of most growers of olives in the Oroville district and fully as good as that of the best 10 growers of the entire district.

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Inventors Who Work *for the* Grain Farmer

By C. B. Sherman

U. S. Department of Agriculture

THE inventions evolved during the past few years by one small group of men in the Department of Agriculture are estimated to have already saved to the people of the United States literally millions of dollars in the marketing of our great grain crop. In each case the invention has been placed under a public service patent which allows its use by the people without the payment of any royalty.

This small group, chosen as an example, are all to be found in the Grain Division of the Bureau of Agricultural Economics. Their inventions have practically revolutionized the cleaning, inspection, and grading of the grain crop of the nation, and results are evident not only in this country but abroad, wherever our grain surplus is exported. Generally speaking they have made it possible so to grade grain as to secure confidence on the part of the farmers as to the accuracy of the grade of the grain which they ship to the terminal markets, confidence on the part of the

The Grain Inspection Office, U. S. Department of Agriculture. The men in the center are using the Boerner sampler.

bankers who finance the industry, and confidence on the part of both the domestic and foreign buyers in the kind of grain that is going to be shipped to them when they buy grain by grade. This confidence did not prevail before these devices and methods were available for accurate grading, and this confidence on the part of the buyer, especially the foreign buyer, has made him willing to pay a higher price for the grain than he otherwise would.

E. G. Boerner
Ass't. Chief Marketing Specialist, U. S. D. A.

Beginning with grain on the farm, a public service patent was recently granted for an aspirator, developed by E. N. Bates, for cleaning grain at the threshing machine. Based on reliable figures, it has been conservatively estimated that if the wheat crop of the West were properly cleaned it would save the wheat region more than $10,000,000 a year—and the wheat region has no millions to spare. The aspirator is designed especially to remove foreign material and smut spores from the grain on the farm and smut is wheat's greatest enemy all over the United States. Aspirators have now passed the experimental stage and are now working in the wheat and rice fields in increasing numbers.

Another patented appliance, invented by J. H. Cox, removes from grain and rice certain weed seeds which are not readily removed by the ordinary cleaning devices.

Reaching the markets we find that E. G. Boerner has devised a grain sampler for accurately splitting samples of grain for analysis. This accuracy is essential to correct grading, for the old method of looking at a sample and assigning the grade merely on the basis of the "look" is a thing of the past. The Federal standards for grain specify for each grade the maximum limits for all of the factors which show undesirable qualities. In practical inspection and grading, the various tests are of necessity made on separate portions of the sample, and to split the original large-sized sample into small portions for analyzing and testing purposes is hardly possible without the use of the Boerner sampler, as this device is known in the trade.

An additional grading apparatus and method involves a weight-per-bushel tester also invented by Mr. Boerner. The "test weight" of grain is one of the governing factors in assigning grades to grain and, in the case of wheat, it is the principal grading factor. The test was formerly made by the use of various devices and no two would give uniform results. This haphazard testing was of little use and led to many disputes. By the use of the weight-per-bushel tester, grain inspectors can now make their tests in an accurate and uniform manner.

The ship sampler is another invention by this group of workers. Under the old system of ship sampling it was the custom to seize handfuls of

grain from the stream of grain as it went into the hold, or to lower a bucket into the cargo hold and catch some of the grain. These methods did not give representative samples, and grading was often very unsatisfactory. The new device takes complete cross sections from the falling grain as it leaves the delivery spout, so that the various samples, when combined, accurately represent the shipment. E. G. Boerner and E. H. Ropes are the men who contributed this improvement to our great export trade in grains.

When protein content of wheat came to be such an important market factor, it became evident that methods for determining the protein content in lots of wheat, as used in different protein-testing laboratories over the country, were not uniform and were not obtaining uniform results. As substantial premiums are now being paid for high protein wheats, and as practically every lot of hard red spring and hard red winter wheat arriving at terminal markets is now tested for its protein content at one or another of these laboratories, there was increasing necessity for getting uniform results from the tests. To aid in this result, the Grain Division, through Dr. D. A. Coleman, has developed a standard method for making protein tests, the value of which is now widely recognized.

Develop Moisture Test

Two scientists in other Bureaus of the Department helped on the work by collaborating to produce a quick method for the determination of moisture content in grain and other substances. This method is developed around an improved apparatus designed by Dr. J. W. T. Duvel and E. Brown and has completely changed the handling and grading of grain in all important grain markets. Its great advantage is that moisture determinations are made on the whole grain, so that there is no loss of water from the grinding of samples, and much time is saved. Without this device, which is commercially known as the Brown-Duvel moisture tester, the grading of grain on a moisture percentage basis as now provided for in the United States standards would be practically impossible.

Coming back to the Grain Division, we find that as the value of flaxseed for crushing depends largely upon its oil content, and the method heretofore used for determining the oil content required about 24 hours, Dr. D. A. Coleman and H. C. Fellows have recently provided an innovation by developing such a simple method for determining the oil content of flaxseed that the test can be made in approximately 10 or 12 minutes. Now they are working out modifications of the technique, in the Grain Division laboratories, to cover many other oil-bearing materials. The test as applied to flaxseed is now in general commercial use at the principal terminal markets of the central Northwest.

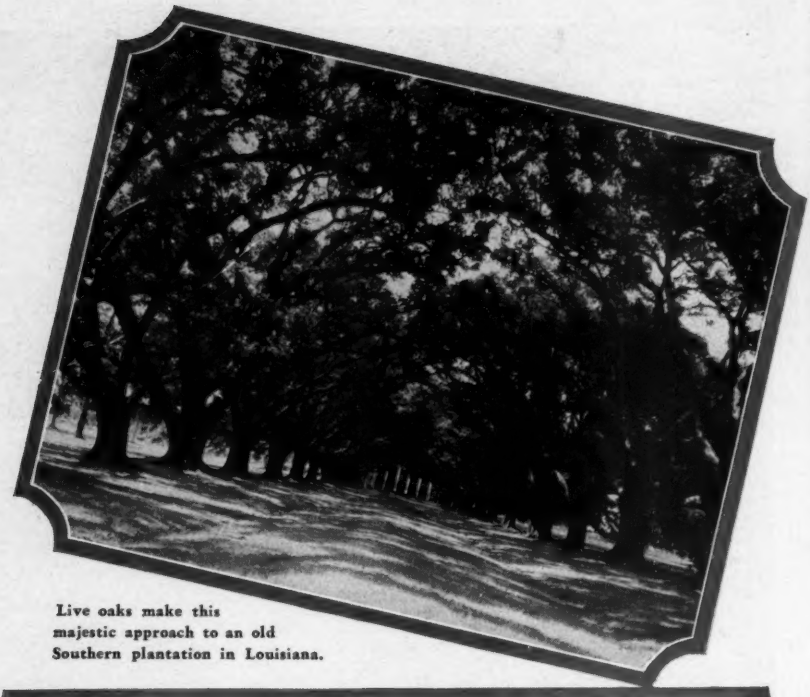
Rice Hulling Machine

Hulls can now be removed mechanically from samples of rough rice by means of a shelling device, invented by W. D. Smith. To ascertain satisfactorily the value of rough rice, it is necessary to remove the hulls, so that certain defects can be detected and the milling quality or hardness of the rice can be determined. It had been the custom for buyers and graders to "rub out" samples by hand before buying or placing a valuation on the rice, but since this estimate is so important to price, and the hand method of rubbing samples results in such wide variations in duplicate "rubbings," the need for an accurate mechanical test had become pressing.

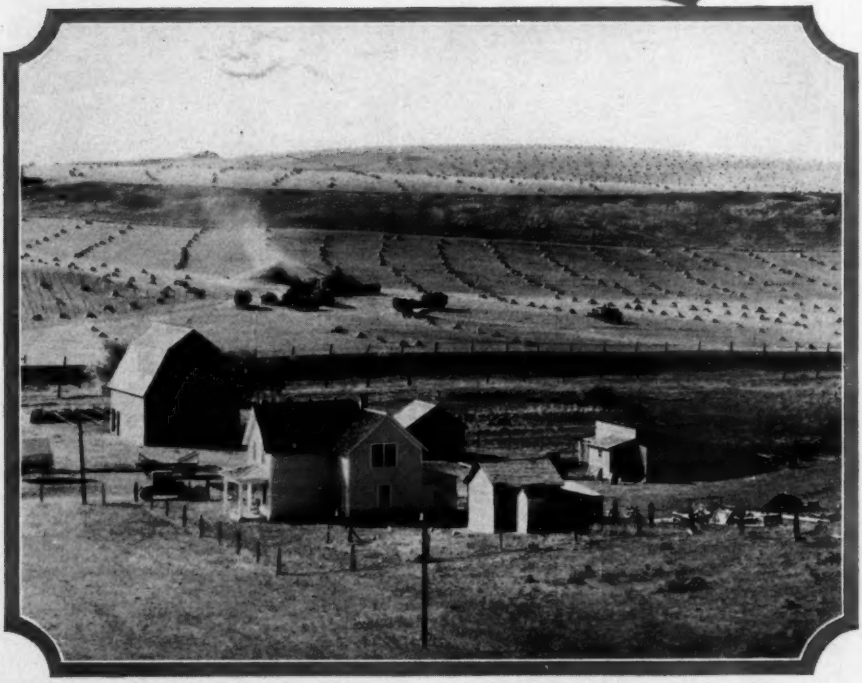
The savings effected by these devices and methods are so extensive and occur in so many parts of the world that they cannot be calculated, yet

(*Turn to Page* 54)

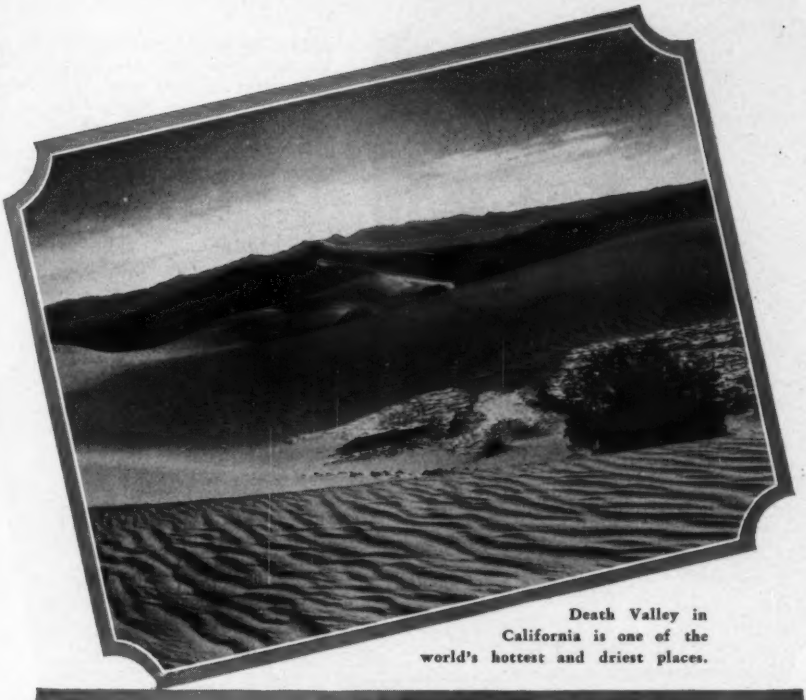
Pictorial



Live oaks make this majestic approach to an old Southern plantation in Louisiana.

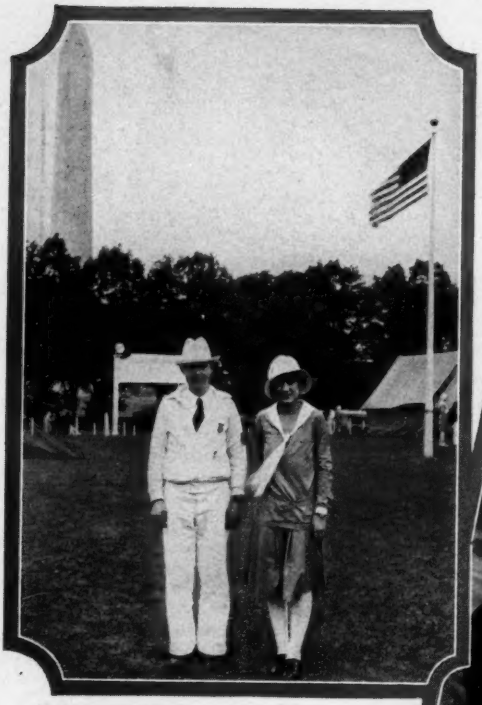


Trees are scarce around these buildings on a big ranch in the Gallatin Valley, Montana.



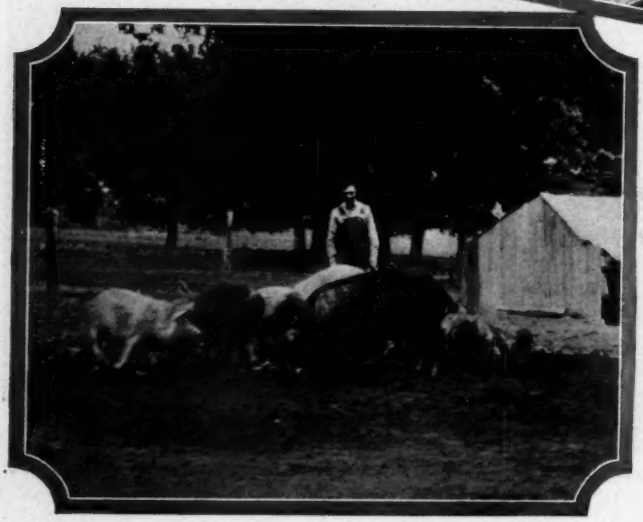
Death Valley in California is one of the world's hottest and driest places.

In sharp contrast to the desert is Picnic Point, favorite spot of students of the University of Wisconsin.



LEFT: Not many youngsters have the opportunity these two had recently when they talked over the radio to the whole U. S. A. They are Montie Rippy of Arkansas, and Mildred Bennett of Minnesota, 4-H club members who attended the National encampment at Washington in June.

RIGHT: County Agent J. W. Hendricks of Catawba county, North Carolina, with a basket of fine Black Ben apples on the farm of H. D. Frye, Hickory, North Carolina.

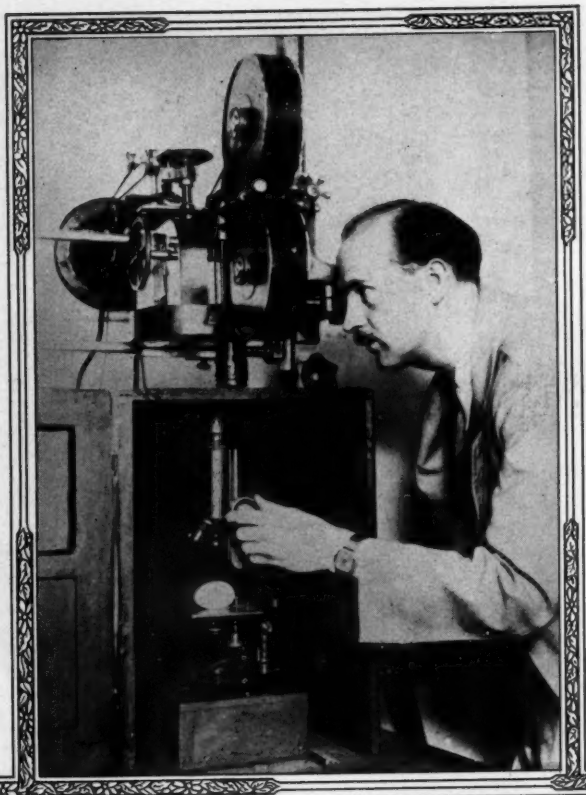


LEFT: Lloyd Hahn, America's greatest miler, who represented the United States in the recent Olympic games, on his farm near Omaha, Nebraska. Hahn plans to settle permanently on this farm inherited from his mother's estate two years ago.

BELOW: J. Clyde Marquis of the Bureau of Agricultural Economics, U. S. Department of Agriculture, is now in Germany assisting in a 3-months' study of agricultural marketing conditions being made by a group of German and American marketing experts and economists. The American commission is headed by Doctor G. F. Warren of Cornell.

ABOVE: Nils A. Olsen, who was recently appointed chief of the Bureau of Agricultural Economics, U. S. Department of Agriculture. Mr. Olsen, who has been with the department since 1919, was brought up on an Illinois farm and has had much farm experience in addition to thorough training in history and economics.

RIGHT: Dr. James J. Durrett was recently selected to take charge of drug control work in the Food, Drug, and Insecticide Administration in the U. S. Department of Agriculture. Dr. Durrett succeeds Dr. G. W. Hoover, who was with the Department for many years and who has resigned to go into private work.



LEFT: The operation of an extraordinary machine which automatically films without human aid the life of a chicken within an egg, records the beating of a turtle's heart, reveals the home life of germs, and the growth of flowers has been perfected. The machine, a combination eight-day electric clock, motion picture camera, and powerful microscope is shown here with its youthful inventor, Carl Dame Clarke, medical illustrator at the University of Maryland.

BELOW: John Robert Knight and Geo. B. Knight, Jr., sons of Mrs. Mamie Knight, Grayson, Ga., picking cotton. These boys with one mule do all the work on a 40-acre farm and support their widowed mother. They had out 10 acres of cotton and 15 acres of corn this past season. They aim to feed the surplus corn to hogs and sell the cotton as a cash crop.

The Editors Talk

Per Acre Plus Per Man

Europe excels in agricultural production per acre. America excels in agricultural production per man.

But emphasis on either one alone is not enough. Either achievement alone is only a partial fulfilment of agricultural possibilities. For the best development of any national agriculture, both are necessary—high production per man plus high production per acre.

To combine these two is America's unique opportunity. Few other countries are so well fitted for the development of both factors, namely, high production per man plus the most profitable production per acre.

America possesses the natural land resources in suitable areas. Farm units are on the average large, or at least adequate in size for economical operation with machinery. In fact, it is this physical basis of the farm unit that has been one of the most important factors in present high production per man, whereas many foreign countries have not this much needed physical basis. Farms are often in smaller units. There are, of course, large and well laid out farms in nearly every country, but broadly speaking smaller units and less machinery are the outstanding characteristics of farms in many foreign countries. Their production per man is therefore limited by this factor and also by denser populations, many of whom must of necessity often work on the land.

In America the picture is different. Production per man is higher. To this it is possible to add the best that Europe has to teach us in the most profitable production per acre. It is well known that the average production in the United States is comparatively low. However, before production per acre will be materially improved there must first be cleared away several mental obstructions that hold us down, chief of which is a too prevalent fear of over-production. This fear cuts right across our proper appreciation of profitable production per acre. We stand too fast by the idea that we must always farm on the extensive basis of high production per man satisfied with only moderate yields; otherwise, we shall all be ruined. We are too afraid of over-production.

Regarding this fear, Warren and Pearson, well-known agricultural economists of Cornell University, have shown that over-production as a cause of depression has been over-rated. Other factors are more important.

Let us face the facts. Farm surveys made of actual farms in different parts of the country show that the lowest cost per unit of crop is obtained by the farmer growing higher than average yields; in other words, better than average yields bring better than average profits. As an inevitable result of producing higher yields at the lowest cost per unit, marginal lands which cannot afford to produce a given crop will be forced to grow what is better suited for such land. Thousands and hundreds of thousands of acres which are now trying to produce corn, cotton, tobacco, wheat, and other major crops at a high cost would have to revert to uses to which they are better fitted.

If America is to attain her possibilities in agriculture, we need now the greatest emphasis on all factors that will produce the most profitable yields per acre. Soil management, plant breeding, good varieties, good seed, and soil in a high state of fertility should all be strongly emphasized. Particularly in the next decade should the proper use of fertilizers be investigated and the results demonstrated in the most practical fashion to every farmer in every area where climatic conditions permit their profitable use.

Western Europe uses vastly greater amounts of fertilizers which are used for one chief reason—because their use makes crop production more profitable.

All questions relating to the most profitable yields per acre need constant and watchful attention. High production per acre, plus high production per man is America's opportunity. Few other countries have the opportunity to an equal degree. But it will need more courage and determination and a bolder and more self-reliant outlook if our agricultural possibilities are to be fully realized.

An American Victory

So longingly have we looked to the Olympic Games for American victories that we have possibly overlooked the Eisteddfod recently held at Treorchy, Wales, in which a choir from Cleveland successfully competed.

An Eisteddfod is a musical festival in which choirs, orchestras, soloists, and practically all types of musical expression compete. An Eisteddfod is a notable occasion in the life of the Welsh people long to be remembered and talked about, much as we might talk about a ball game. Interest in the humblest homes is keen; training and preparation are strenuous.

It is, therefore, particularly gratifying to learn that the choir from Cleveland was successful. The following is rather an intimate and interesting account from a correspondent at Treorchy, published in Great Britain.

"I was outside the pavilion last week when the adjudication in the male voice competition was being given. A dense crowd awaited the final decision. Suddenly a big American charged down with a yell that realized all one's boyhood dreams of what a Red Indian war cry should be. His yell was answered by a chorus of shouts, and all at once a group of big Americans was executing a frantic dance of triumph, locked in each other's arms and shouting like mad. Professor Dawe, who brought the Cleveland Choir over to Mold and Swansea, was hoisted on heaving shoulders, his hat knocked over his eyes, his tie flying loose, and his voice ringing across the field. The lady who had accompanied for the choir was next lifted to what must have been a precarious eminence in that wildly excited throng, and Professor Bassett, the conductor, was treated in the same way. Staid American ladies kissed other staid ladies and members of the choir, and finally the whole mass broke into 'My Country, 'Tis of Thee,' followed by a rendering of 'Hen wlad fy nhadau' that made the hills resound. Handkerchiefs and hats were waving, and the last scene of all was a photographer climbing on the roof of a neighboring shed with a camera and the triumphant choir trying to subdue its excitement sufficiently to be properly grouped. It was a good ending to a good day."

Why not the greater development of singing in American life? The choir from Cleveland has not only won glory for itself, but set an example.

Fertilizer Economics

In a review of the fertilizer industry in the United States from its beginning to the present time much information is readily available on imports, consumption, and wholesale prices. However, very meager data can be obtained on the prices paid by farmers at their local purchasing points. The records kept by the Pennsylvania Department of Agriculture, Bureau of Foods and Chemistry, are, therefore, greatly appreciated by anyone seeking this information.

Wholesale prices have been available in trade journals, but as far as we know, with the exception of New York State over a short period of time, Pennsylvania is the only state which has kept any record of retail prices. Since about 1905, the Pennsylvania Bureau has recorded the actual price per ton that John Doe paid for fertilizer in his home town.

While wholesale prices of fertilizer materials are slightly above prewar prices, the price of labor is very nearly double the prewar price. This price of labor has a very important effect on the retail prices of fertilizer, since the distributing costs on fertilizers are primarily wages for labor.

Before the war, the consumption of fertilizers increased at the rate of five per cent per year, from 1900 to 1914. Since the beginning of the war, the rate of increase has only been about one per cent per year, and in some years there has been a marked decline in tonnage. One of the probable factors that has operated to keep fertilizer consumption relatively low has been the increased cost of distribution.

The Pennsylvania data not only makes it possible to determine the change in the retail prices of fertilizers from year to year, but it also makes it possible to determine the average change in the retail price caused by changes in guaranteed analyses.

Organized Science

There are approximately 700 technical and scientific organizations and societies in the United States. This is exclusive of organizations directly controlled by universities which must be added to the 700—surely enough scientific organizations to meet the requirements of progress and the needs of everybody.

A ready guide to these societies has been prepared by the National Research Council of the National Academy of Sciences under the direction of the Information Service of the Council. The work was done by Clarence J. West, Director of the Service, and Callie Hull, assistant to the director.

In which society or organization are you most interested? To start on safe and universal ground, there are independent societies devoted to individual flowers. The list includes dahlias, gladioli, iris, peonies, roses, and orchids. Moss lovers have formed an organization of their own, as have people whose interest centers in ferns. Other than the horticultural and quite technical societies, this list seems to cover the organizations devoted to flowers.

Do you stand up right? If not, there is a posture league whose object is to do scientific and educational work in the standardization and improvement of conditions affecting the posture of the human body.

What might be called the most distant society is the Association of Variable

Star Observers. Another society spreads the truth and knowledge about reptiles. The Horological Institute dignifies time and the people who keep the correct time for us.

Medicine, agriculture, and engineering, of course, occupy prominent places in the scientific societies and organizations of the United States. But the list is very varied and to the layman perhaps a little exclusive and mysterious. For instance, there is the Orthopsychiatric Association, the Otological Society, the Pediatric Society, the Phytopathological Society, the Psychiatric Association, the Society of Parasilologists, also the Society of Ichthyologists and Herpetologists. All of these societies are national in scope, American preceding each of the above titles. The list is perhaps significant as showing the development of scientific thought.

We have made progress. Scientific associations and societies are essential. They do excellent work, but we now hardly know the name by which a fellow scientist should be called. He talks a separate and distinct language. There is apparently no escape, for no one man can understand everything.

But is there not a danger of over-emphasizing scientific detail and calling it knowledge? Are we not underestimating somewhat the philosophy, the real meaning of science? We need facts; we need detail, but beyond that there is a need, unless science is to fall of its own weight in unrelated facts, a great and urgent need for men who can see through scientific subject matter to the related and simple truths that lie beyond; truths as they affect the vital tide of human life.

For this reason, the National Academy of Science, The Smithsonian Institute, whose object is to increase the diffusion of knowledge among men, the American Association for the Advancement of Science, and other organizations, in emphasizing science as a whole and bringing together its different branches, are doing a much needed and excellent work. The guide to these societies and organizations is extremely useful and a much needed publication.

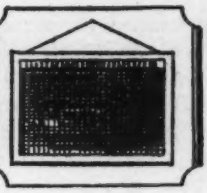
Diagrams Work

The Ohio Agricultural Experiment Station is to be congratulated on a recent published report of their field work. The bulletin is appropriately named "Field Work Guide." On the centre page is a map of the different experimental farms from which a total stranger could locate any particular experimental plot in which he was interested without the aid of a member of the experimental staff. The location of prominent experiments is indicated by number on the map; the same numbers follow the headings of the tables of results given in the bulletin, making it possible to determine the location of any prominent experiment for which data are presented. These data include results of tests of crop varieties and cultural methods, and experiments with fertilizers, lime, manure, and crop rotations.

The cover of the publication has a very attractive scene on an experimental farm.

This is the first guide of experimental work that we have seen. The idea is a capital one and makes readily available the most important work which the experiment station is doing. It, therefore, will prove a time-saver in presenting interesting work to visitors at the station.

AGRICULTURAL DEVELOPMENTS



By P. M. Farmer

BETTER RUST-RESISTANT WHEATS

Strains of wheat still more resistant to rust than Marquillo, a variety developed not long ago in Minnesota, are being tested by plant breeders of the University of Minnesota in cooperation with the U. S. Department of Agriculture. An indication of the progress of this wheat improvement work is found in the fact that the promise of these new strains is being brought out even before Marquillo has been multiplied enough to provide seed for distribution. Marquillo in the bad rust year of 1927 averaged 31 bushels to the acre while the old reliable Marquis produced only 19 bushels. Marquis had 95 per cent of rust while Marquillo had only 6 per cent. During that same year of rust prevalence some of the new strains yielded at a rate 35 per cent greater than the very good Marquillo. It looks as if the plant breeders are going to give wheat rust a "ride."

THE SWEETENING FLOOD WATERS

The Vermont floods of last year have been found, as a result of tests by Professor Van Alstine of the Vermont Extension Service and H. H. Bennett of the U. S. Department of Agriculture, to have added much lime in the deposits strewn over the lowlands. Since much of the farm land in this region was so acid as to require frequent applications of lime, what is the explanation of this sweetening action of the swirling waters? These soil scientists say the answer lies only a little way beneath the surface. Formerly all the surface soil in this region was plentifully supplied with lime, but it was gradually leached out, even out of the surface of rocks that lay on the fields. But the subsoil and the centers of the rocks still held their stores of lime. The flood, not stopping after tearing away the surface soil, dug into the subsoil, mixed it with surface soil, and spread the mixture with its lime over meadows, pastures, and fields. Much of this land with a veneer of sand and gravel presents a discouraging aspect, but it is a more favorable home for legumes than the old sour soil. Nobody wants floods, but if we must have them let's hope they'll be sweet ones.

A NEW FEATHER FOR THE JERSEY

If the Jersey cow were addicted to millinery she would now be adding another feather to her hat, for dairy specialists at the New York State Agricultural Experiment Station have taken issue with the old notion that rich milk does not make high-quality cheese. Recent tests, which corroborate some old ones made at the same station, show that excellent cheese can be made from milk testing more than 5 per cent butterfat, and that the yield of cheese is greater per hundred pounds of milk than from milk containing less fat. The conclusion is that cheese made from milk with more than 5 per cent fat is fully equal in quality to that made from milk containing from 3 to 4 per cent fat, and awards at recent State fairs and at the National Dairy Show have sub-

stantiated the statements of the New York specialists. Since milk is usually sold to the cheese factories on the basis of fat content, this conclusion is of great importance. The test showed that the high-test milk—above 5 per cent—produced 13 pounds of cheese per 100 pounds, while 4 per cent milk yielded 10.5 pounds of cheese, and 3 per cent milk produced 8.2 pounds from 100 pounds. The loss of fat in the whey was no greater from the high-test milk than from the low-test.

HUMAN HUSKER STILL SUPREME

By a mere twist of the wrist the husky Iowa corn-huskers have shown that they are equal to the contraptions produced by the machine age. Economists of Iowa State College, as a result of comparisons of results on farms where mechanical corn-huskers were used and on farms where the wrist method is favored, announce that the machine method is no cheaper if as cheap as the hand. On none of the farms where records were kept was the difference between the two methods great, the largest difference being a half cent per bushel in favor of hand husking.

SWEET CLOVER RESCUES BLUEGRASS

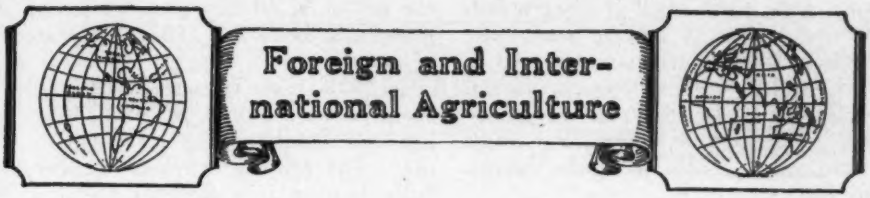
When bluegrass pastures become practically useless in midsummer because of heavy spring grazing, dry weather, and starvation, there is an easy way out of the problem of feed production, says L. F. Graber of the Wisconsin College of Agriculture. The Wisconsin plan to improve the bluegrass is to seed sweet clover right on the sod, a plan that has worked well for four years. The land must have plenty of lime and phosphate in it or the sweet clover will fail. Seeding must be heavy, about 30 pounds to the acre, and previous to this any accumulation of old bluegrass must be burned off. The Wisconsin tests showed that the combined yield of sweet clover and bluegrass is frequently twice and even three times that of the bluegrass alone. No grazing is allowed the year of seeding, but the second year the sweet clover makes excellent grazing during the dry period. By the third year the bluegrass has often been so stimulated by the nitrogen collected by the sweet clover that its heavy growth prevents the reseeding of the clover.

MILKERS CAN'T BEAT MACHINE

Unlike the Iowa corn-huskers who successfully met machine competition, the boys who milk the cows haven't been able to make the grade alongside the mechanical milker. As a result of careful experiments at Iowa State College, it is concluded than on a herd of from 20 to 25 cows the machine will save about half the time required in milking by hand and reduce the cost about one-fourth. The investigators say the yield of milk is the same by hand or machine; that machines are commonly left on the cows too long—4 to 6 minutes long enough; and stripping after the machine should always be practiced.

JUST A WORD

The day is probably not far off when a farmer's letter to his county agent will look something like a doctor's little note to the druggist. According to Agronomist L. H. Smith of the University of Illinois, the next term the farmer will take to his bosom is "soil colloids." Not many years ago "bacteria," "protein," "humus," and "legume" were only rarely met with outside the laboratory and would have withered the grass had a farmer used them, but time has changed methods and, along with them, vocabularies.



Notes from South Africa

By W. Jerwitz, Ph.D.

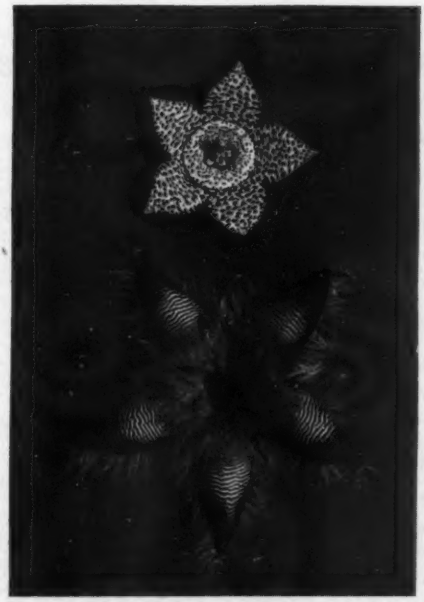
Cape Town, South Africa

EDITOR'S NOTE—*The following notes, together with some very interesting photographs, one of which we reproduce herewith, were received from Dr. W. Jerwitz. We believe they will be very interesting to our agriculturists who have never had the opportunity of visiting this far-away country which is so rapidly developing its agricultural possibilities.*

SOUTH AFRICA is a country of contrasts in many respects, and this is true also of its climatic conditions—summer rains on the east coast, winter rains on the west coast, and an interior where there are districts with summer rain and large areas of a prairie or even desert character.

Sharp contrasts are found often between districts adjoining each other. Thus, Worcester has a rainfall of about 10 inches, while the adjoining Ceres separated from Worcester only by a narrow mountain range may have a rainfall of 60 inches or more.

In accordance herewith we find also a pronounced variation in regard to the indigenous flora of South Africa. Of particular interest is undoubtedly the flora of the very arid grotesque forms as nature has chosen to adapt the plants to the droughty conditions prevailing here either during parts of the year or all the year round. Plants can be found with flowers which are very ornamental showing peculiarly delicate designs with a mixture of colors ranging from yellow to red brown. One is reminded of artificial hat flowers. As pretty as these flowers are, so far as appear-



These two South African flowers are beautiful in design and coloring but have a most repulsive odor resembling that from rotten meat.

ance goes, their smell is disagreeable, reminding one of rotting meat. By these means flies are attracted, and in this way the plants achieve pollination.

The use of fertilizers in the profitable production of commercial crops is growing as evidenced by the following instance:

In 1927 I inspected the citrus groves of Messrs. Van Zyl Bros., of "Middelpos" Citrusdal. They were particularly worried by one of their groves consisting of 400 Navels and 300 Valentia late. The soil consisted of a deep rather sterile sand and the trees looked miserable. They were then about 10 years old and had never given a decent crop.

From the 400 Navels they obtained in that particular year about 100 boxes all in all. It was evident that the trouble was due to starvation and a good dressing of fertilizer was applied, per hundred trees 300 lbs. blood meal, 200 lbs. sulphate of ammonia, 500 lbs. superphosphate, 100 lbs. Egyptian rock phosphate, and 300 lbs. sulphate of potash, introducing into the soil 70 lbs. of nitrogen, 120 lbs. of phosphoric oxide, and 150 lbs. sulphate of potash.

In 1928, these trees were inspected again about a month before harvesting time and the results were astonishing. The growth had been wonderfully improved in spite of the fact that the trees bore a very good crop. Messrs. Van Zyl expect to harvest from their 400 Navels at least 1,000 boxes this year. This means an increase of 900 boxes. The increase therefore will bring a net return of approximately $1,125. If the fertilizer is put down at $125 which includes a long distant transport to the farm and expenses of sowing the fertilizer, a net profit of almost $1,000 is to be obtained from an expenditure of $125.

It need scarcely be pointed out that this result is a great encouragement to the surrounding farms to use fertilizers in this district in which fertilizers have been practically unknown until last year.

Quality Production Pays

(*From Page 27*)

The writer's individual tract consisting of nine acres fertilized in a definite way gave a total yield of 31,611 pounds of olives or a yield 1.42 tons per acre. This tract not only outyielded the average of the entire grove but also yielded better than any of the individual tracts. There were 25,614 pounds or 12.8 tons of pickles and 5,997 pounds of oil olives. This tract gave a yield of pickling olives of 81 per cent. The 12.8 tons of pickles were of high quality. The crop consisted of the following sizes: 4,580 pounds of mammoth; 10,290 pounds of extra large; 7,921 pounds of large size, and only 2,823 pounds of the medium size. The value of this quality crop based upon the prices indicated above was as follows:

4,580 pounds mammoth size at $230 per ton	$ 526.70
10,290 pounds extra large size at $175 per ton	901.37
7,921 pounds large size at $135 per ton	533.67
2,823 pounds medium size at $75 per ton	103.86
5,997 pounds oil olives at $50 per ton	150.00
Total	$2,215.60

The cost of cultivation and care of this tract for the year 1927 was $324. The cost of the picking of the crop was $308.16, while the cost of

(*Turn to Page 48*)

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

A bulletin recently published by the Agricultural Experiment Station, College Park, Maryland, has a very significant title. It is called, "Fertilizer Ratios for Prince George County," Bulletin No. 294, by A. G. McCall.

The word "ratios" emphasizes, of course, the idea that the ratio rather than the analysis is important. We are very glad to see this title used. In the bulletin will be found several pages of the triangular diagram representing the fertilizer ratios employed in the fertilizer studies. The sooner we learn to study such work from the ratio viewpoint the quicker we shall be able to correlate results obtained in different parts of the country.

Several soils were included in the experiment cited, namely, Leonardtown silt loam, Leonardtown loam, Collington sandy loam, Norfolk sand, and Sassafras loam. The basic materials used for the fertilizer mixtures were commercial grades of nitrate of soda, acid phosphate, and muriate of potash.

The experiments were conducted on wheat in tile plots of glazed sewer pipe 18 inches in diameter and 22 inches long set into the ground to a depth of 20 inches. The fertilizer was transferred from the field to the plots, but was thoroughly mixed and sifted and the top soil and subsoil were placed in the same position as they were found in the field. Several tables are included in the bulletin, giving the results in detail.

An excellent bulletin has been published by the Agricultural Experiment Station, Raleigh, North Carolina, on the "Influence of Crop Rotation and Soil Treatments upon the Yield of Crops on Cecil Clay Loam Soil," Bulletin No. 256, by C. B. Williams, S. K. Jackson, and F. T. Meacham. Five rotations were used in the experiments.

"Published Quarterly Report of Individual Samples of Commercial Fertilizers, Season 1927," Serial No. 107, Department of Agriculture, Atlanta, Ga.

"Commercial Fertilizers for 1928," Control Series, Jan. issue 1928, No. 125, State Fertilizer Inspection Service, U. of Md., College Park, Md., N. E. Gordon and L. E. Bopst.

"Fertilizers for Early Cabbage, Tomatoes, Cucumbers, and Sweet Corn," Agr. Exp. Sta., Wooster, Ohio, Bul. 420, May, 1928, Donald Comin and John Bushnell.

Soils

"Reclamation of the Fresno Type of Black-Alkali Soil," Agr. Exp. Sta., Berkeley, Cal., Bul. 455, June 1928, W. P. Kelley and E. E. Thomas.

"Soil Temperature Studies with Cotton," Agr. Exp. Sta., Gainesville, Fla., Bul. 197, May 1928, M. N. Walker.

"The Effect of Sulphur on Soils and on Crop Yields," Agr. Exp. Sta., College Park, Md., Bul. 296, Jan. 1928, R. R. McKibbin.

Crops

An interesting folder dealing with the Eastern farmer's problem of producing at home feed for his dairy cows, is found in Extension Circular 81, "Alfalfa on New Hampshire Farms." by Ford S. Prince and G. L. Waugh. The illustration shows a cow standing in Vermont and New Hampshire with her neck stretched to reach a grain bag in Iowa. The caption is

"Wouldn't it be more profitable to feed her at home?"

In the discussion of how alfalfa may be made a profitable crop in New Hampshire, the authors point out that New England soils must be made fertile. "The need for chemical fertilizers has not been so clearly recognized by New Hampshire growers," according to the circular. "Minerals, especially acid phosphates, are essential for highest yields of alfalfa. Potash also increases yields and helps to prevent winter injury."

The little folder is a concise reference on points which must be considered in introducing this important legume crop on New England dairy farms.

New Jersey has published the results of its study of permanent dairy pastures in Cir. 141. H. B. Sprague and H. W. Reuszer give an exhaustive report on work which has been done with drainage and cultural treatment of lands which are intended for permanent dairy pastures. The circular is of particular interest, because of the importance which is now being given to pasture management in the United States.

"The Effect of Interplanted Legumes on the Yields of Corn," Agr. Exp. Sta., Fayetteville, Ark., Bul. 229, July, 1928, C. K. McClelland.

"Cooperative Extension Work in Agriculture and Home Economics," Agr. Ext. Div., U. of Fla., Gainesville, Fla., Wilmon Newell.

"The Fortieth Annual Report of the University of Maryland," Agr. Exp. Sta., College Park, Md., Vol. 40, 1926-1927.

"Strawberry Culture," Ext. Serv., Durham, N. H., Ext. Cir. 82, May, 1928, L. P. Latimer and H. A. Rollins.

"Fiftieth Annual Report of the North Carolina Agricultural Experiment Station," Raleigh, N. C.

The Bimonthly Bulletin, Agr. Exp. Sta., Wooster, Ohio, Vol. XIII, No. 4, Whole No. 133, July-August, 1928.

"Mixtures of Spring Cereals and Flax in Ohio," Agr. Exp. Sta., Wooster, Ohio, Bul. 421, July, 1928, L. E. Thatcher.

Department of Agriculture and Immigration of Virginia, Richmond, Va., Bul. 248, Aug. 1928.

Economics

"Agricultural Statistics of Florida, 1927," (Quarterly Bulletin Department of Agriculture, July, 1928) Tallahassee, Fla., Vol. 38, No. 3 presents very workable data on the crops, livestock, and miscellaneous farm sales by counties in the state of Florida, for the year 1927.

"A Study in the Ratios of Assessed Values to Sales Values of Real Property in Oregon," Agr. Exp. Sta., Corvallis, Ore., Sta. Bul. 233, June, 1928, W. H. Dreesen.

Illinois Crop Reporter, U. S. Dept. of Agric., Washington, D. C., Cir. 380, July 1, 1928.

Insects

Much research on the removal of spray residue from apples and pears has been done in the State of Washington. Results are published in three bulletins, as follow:

"The Removal of Spray Residue From Apples and Pears in Washington State," Agr. Exp. Sta., Pullman, Wash., Pop. Bul. 142, July, 1928, J. R. Magness, F. L. Overley, F. D. Heald, J. R. Neller, D. F. Fisher, H. C. Diehl.

"Arsenical Spray Residue and Its Removal from Apples and Pears," Agr. Exp. Sta., Pullman, Wash., Bul. 226, May, 1928, F. D. Heald, J. R. Neller, F. L. Overley.

"The Removal of Spray Residue from Apples and Pears," Agr. Exp. Sta., Corvallis, Ore., Sta. Bul. 234, June, 1928, Henry Hartman, R. H. Robinson, and S. M. Zeller.

Diseases

"Pear Blight Control in California," Agr. Ext. Serv., Berkeley, Cal., Cir. 20, June, 1928, Leonard H. Day.

"Tomato Wilt Disease," Agr. Exp. Sta., Manhattan, Kans., Cir. 140, June, 1928, R. P. White.

A SAFETY ADVOCATE

Safety First Teacher: "Norman, give me a sentence using the word 'diadem'."

Pupil: "People who drive onto the railroad crossing 'diadem' sight quicker than those who Stop, Look, and Listen."—*Studebaker Wheel.*

A home-made sweet clover seed harvester which is giving satisfactory results.

A Sweet Clover Harvester

By Robert V. Peterson

Oklahoma A. & M. College

A SWEET clover seed harvester that has for its foundation the wheels, frame, and platform of an old grain binder is being used successfully on a number of farms in Oklahoma. Easily constructed with but little expense and absolutely dependable, the machine promises to find wide use wherever sweet clover is raised.

The blade and table of a binder are removed and replaced with a big hopper or seed catching box. The lower half of the hopper can be sided with wood, using canvas or wire screen for the upper half. The entire lower half of the back panel can be made as a shutter, or a door can be built in to facilitate the removal of the seed.

The drive is direct from the bull wheel sprocket to the small sprocket on the beater shaft. The sprocket on the reel shaft embodies a jaw clutch for throwing the reel in and out of gear.

One successful harvester has three five-foot posts of 2x½ inch iron supporting the reel which is five feet in diameter. The blades are of 1x4 hardwood material. The shaft is 1⅛ inches in diameter.

Paul Stritke of Oolagah, Oklahoma, who has had one of these home-made machines for some time, estimates that its efficiency is from 70 to 80 per cent. He points out that the seed can be harvested any time after the seed is perfectly ripe, as heavy shattering is desired. He believes that with this machine the large, plump, fully ripened seeds are saved, the principal losses occurring in the immature and less desirable seed. With the

ordinary binder the results are exactly the opposite.

Another advantage of this machine is that the seed is harvested when perfectly dry and in condition to be stored at once without any danger of heating—an important point in handling sweet clover.

Mr. Stritke estimates that the draft is about equal to that of a binder, varying with the heaviness of the crop. With his six-foot machine he harvests from eight to ten acres a day, the capacity being reduced by the necessity of stopping to shovel the seed into a wagon.

The machines have been used successfully on soybeans and may have a place in harvesting alfalfa seed.

Quality Production Pays

(*From Page* 44)

delivering the crop to the packing plant was $94.20. The taxes on the land were $24.73. Thinning the fruit cost $20. Fertilizer cost $137.-50. Interest at five per cent on a valuation of $850 per acre was $375, making a total of $1,283.59. This tract paid all expenses of production including five per cent interest on an investment of $7,500 and left a clear profit of $932.01 or $103.44 per acre.

If the interest item is not figured at five per cent, the total cost of production is $908.59. The total income is $2,215.60, the net profit is $1,307.-01 or $145.22 per acre or 17.4 per cent return on an investment of $850 per acre.

These results indicate quite clearly that quality production in agriculture pays. Also that quality products in agriculture may be obtained by proper methods of production. And, as in industry, the quality product finds a ready market at a good price.

This is not a special case or an isolated instance of the application of this principle of production. Numerous farmers throughout the land are making good money through a knowledge of the workings of this business principle. The government irrigation projects have been a bone of contention in Congress and the public press during the past few years. Most of the projects have been financial failures and the farmers on many of them have sought and obtained government relief.

Yet, Area Wimsett, who taught school in Iowa for a good many years, came to the Newlands Reclamation project in Fallon, Nevada, in 1922. He had exactly $2,400 with which he contracted for 120 acres of government land on this project. He commenced to produce quality products for the market, principally turkeys and dairy products. Five years later, in 1927, he had a farm worth $15,000 on which he actually made six per cent interest and had $3,200 left over as payment for his labor and management. During the worst period of farm distress in the United States this school teacher increased his capital from $2,400 to $15,000 all within five years and made during 1927, $4,700 for his year's labor and interest. There are few lines of human endeavor where this could be duplicated. His formula is a very simple one; he keeps records and knows exactly what he is doing. He quickly detects the leaks in the business and stops them. He buys in quantity lots and sells quality products.

There is probably no better opportunity in any line of work right now than in agriculture for the young man who is farm-minded and possesses the necessary business ability.

Solving a Buggy Problem with Bugs

By W. L. Wilkinson
County Agent, Kingsville, Texas

THE accidental introduction of the Cottony Cushion Scale from Australia into California has added one more insect pest to the long list that now affect the fruit growing sections of the United States, especially those sections where citrus fruits are grown.

With the egg sack of the adult female sometimes containing as many as 1,000 eggs, this scale reproduces very rapidly and will attack all citrus trees, and many other trees, so intensely that they are weakened and consequently killed unless control measures are applied. It also attacks rose bushes and other shrubbery. This scale, therefore, had not been in this country very long before its rapid spread and fatal injury made it evident that the citrus industry was being threatened.

The surface of this scale being a whitish, ribbed, cottony mass of eggs and to a great degree waterproof, it was found that the usual sprays recommended for controlling other scale insects were useless. Therefore, it was necessary to go to Australia, the native habitat of this scale, and find its natural enemy as a means of control. This investigation resulted in the importation of the Vedalia Lady Beetle (Novious cardinalis) that has proven without fail to be the only real effective means of control.

The Vedalia Lady Beetle, unlike most insects, can not stand very much cold weather, and the Cottony Cushion Scale is its only food. Unfortunately this beetle can not survive after it has practically cleaned up an outbreak of the Cottony Cushion Scale, and so at times it is necessary to restock them.

As an instance of how effectively the little beetles work the following is cited: In the latter part of December, 1924, a cold wave swept over the Southern States freezing all the Vedalia Beetles in California, Texas, Mississippi, and Florida. This gave the Cottony Cushion Scale an unmolested opportunity to spread. June 26th, 1925, the county agent of Kleberg county, Texas, found a serious outbreak of the Cottony Cushion Scale at Kingsville, the county seat. He at once wrote to Mr. Cel Curto, Chief of Division of Plant Pathology and Seeds, Austin, Texas, for Vedalia Beetles, but found that he was unable to secure even a colony of them from any of the citrus growing states. However a continuous search was made for the beetles. All this time the scale was spreading from tree to tree and from grove to grove killing trees and shrubbery. Scarcely a day passed that the county agent did not get an office or phone call notifying him of a new outbreak of this scale on citrus trees.

Like all other sucking insects, this scale emits a sweet sticky substance called honeydew. Garden ants, desiring to harvest a good crop of this honeydew, were busy caring for the eggs of the scale and carrying them from place to place thus causing the scale to spread more rapidly than it naturally would have. Song birds caused this scale to spread from grove to grove by carrying the eggs on their feet. Citrus trees, the trunks of which were six and eight inches in diameter, were killed and many others were dying because of this scale.

November 1, 1925, the good news came that Mr. E. W. Halstead had finally succeeded in getting a colony of about 12 of the Vedalia Lady Beetles. Mr. Halstead was with the Division of Plant Pathology, Department of Agriculture, State of Texas, and located at Mission, Texas. In order for Mr. Halstead to get enough beetles from this small number to send out to attack the scale, it was necessary for him to start a "Bug Hatchery."

This hatchery was made of a wooden box with a glass top for furnishing light, and cheese cloth sides to let in air. As there was no Cottony Cushion Scale in the Rio Grande Valley, Mr. Halstead sent to Kingsville for food to feed his beetles. The county agent sent him a three-pound coffee can full of the scale each week, that the beetles might not get hungry.

By December Mr. Halstead had enough beetles in his hatchery to send a colony of 12 beetles to Kingsville. These were introduced onto a citrus tree by taking a flour sack and slipping it over a limb heavily infested with Cottony Cushion Scale. After emptying the beetles in the sack the open end was tied around the limb so that the beetles could not get out. Ten days later the sack was removed, for by that time the beetles had become well established and the young or larvae could be seen feeding on the scale.

The Vedalia Lady Beetles are very small but quite active and can be seen running all over the branches of the trees from which they are cleaning the scale. They can fly a short distance and thereby extend their good work from tree to tree and from grove to grove.

In order to get the destructive work of the Cottony Cushion Scale stopped as quickly as possible, the county agent took colonies of the beetles from trees where they were the thickest and introduced them on all the groves that were infested with the scale. By doing this the beetles had the scale under control by the first of June 1926. As soon as these hard-working, valuable little beetles had freed the trees of the scale they had no food left and therefore starved. The trees, that were not killed by the scale before we could get the Vedalia Beetles, began convalescing and putting out new leaves and branches. These little beetles saved the citrus growers of Kleberg county thousands of dollars, and trees that would take 10 or more years to replace.

MAKE FERTILIZERS MOST EFFECTIVE

In using fertilizers that cost $30 to $40 a ton, it is important that general soil conditions should be as favorable as possible, points out Professor A. W. Blair, soil chemist at the New Jersey Agricultural Experiment Station.

"A soil that is strongly acid may limit the growth of certain crops to such an extent that the fertilizer can have little effect," says Professor Blair. "It is a waste of money to use fertilizer on such land. When the acidity of the soil is eliminated by the use of lime, good results may be expected from the fertilizer.

"Sometimes the land is so wet that crops can make only very poor growth, fertilizer or no fertilizer," he states. "Until satisfactory drainage is provided, it is a waste of money to use high-priced fertilizer on this kind of land.

"On land that is very sandy and poorly supplied with organic material, growth of crops is often limited by the water supply. Heavy applications of fertilizer cannot produce good crops under these difficulties. First of all, organic material must be added to the soil; then the fertilizer application may be profitably increased."—*L. H. Woodward, County Agent, Warsaw, N. Y.*

Pages From A Field Note Book

Soybeans Show Potash Hunger

By I. J. Mathews

Winamac, Indiana

ONE of the most interesting object lessons shown to one of the three field-meeting sections of the National Soybean Association which held its annual meeting in Indiana on August 15, 16, and 17 was a potash demonstration on the farm of Chester Joyce in Carroll county, Indiana.

For years it has been known that many low spots, locally termed "bogus," are deficient in either potash or lime or both. It has been common knowledge for years that when planted to corn, these spots need an abundant application of potash salts. But the soybean is very sensitive to fertilizer concentrations in contact with the seed. It apparently had never occurred to anyone that the crop might demand even more potash than corn for satisfactory growth on such soil or any other.

But Chester Joyce, the soybean grower visited, made such a test. In one of these "bogus" spots, after the beans were planted, he top-dressed several rows with 200 pounds per acre of muriate of potash. This was cultivated into the soil.

At the time this plot was seen on August 15, the soybeans that had not received potash were about 12 or 14 inches high, were light green in color, with the under leaves appearing brown, ranging to yellow a little higher up and with the rims of the leaves still higher showing yellowish splotches.

The soybeans that had received the potash treatment were from 24 to 30 inches tall and a very dark, uniform green. A conservative estimate is that the beans which received potash would make at least two and possibly three times more tonnage of hay per acre than those not treated.

A Rough Pasture Makes Good

By R. A. Payne

Northampton, Massachusetts

ABOUT eight years ago Robert Clark of Woodbury, Connecticut, had a typical brush-cover pasture which partially fed 10 cows during the summer. Starting early in July, green feed or hay had to be fed as well as a regular winter ration of grain. Today this pasture, supplemented only with a limited amount of low protein grain, furnishes more than enough feed for 25 high producing Holstein cows.

This change in the productive capacity of the pasture did not come free nor was it a matter of luck. Mr. Clark is one of the dairy farmers who

was not satisfied that going out of the dairy business was the right answer to the pasture problem. At the suggestion of a former County Agent, Mr. Davis, he tried lime, superphosphate and muriate of potash—not alone but in combination—as a top-dressing on two plots on his originally unproductive pasture. One of these plots was near the pasture gate and was practically free from brush. The other was on the far side of the pasture and had nearly a perfect stand of moss. The area between these plots was thick with brush.

Today these two plots as well as the pasture between are free from brush and moss and would cut a better hay crop than the average mowing. The Kentucky bluegrass the middle of June was knee high and the white Dutch clover stood up like alsike. The cows fill up in about an hour on this pasture and then retire to the shade of the nearest trees to chew their cuds and to make milk. When approached they do not act the same as the hired man when caught asleep on the job. They get up politely and in a few minutes lie down as they have their foraging work done.

Mr. Clark while going over the pasture said, "You would not believe that only eight years ago that this was just a rabbit pasture, worth about $10 an acre. On these 30 acres we cut about 25 cords of wood. The brush was so thick that on some acres three of us working all of our spare time could not clear over an acre in two months.

"That must have cost a lot," we ventured.

"Yes," replied Mr. Clark, "but we were not very busy with other work just then. Besides, did you ever really get something for nothing? I figured it this way—our grandfathers made their money in dairying from the pastures. When you stop to think that with nothing going back on the pastures there was no reason why they should not get poorer. If these pastures were once good, it should be possible to bring them back by supplying the things which had been removed by the cattle. Lime and phosphorus are being sold from the farm in milk and in stock. The potash in the manure is lost to the pasture because it is put on the crop land. I have worked it out so that the manure is spread every day from crop planting time till well into December—not on the crop land but on the pasture."

"I started this in a queer way. My hired man wanted to beat the County Agent so he put some manure next to the plot which had the lime and fertilizer. The results from the manure alone were poor. That fall lime was put on part of the manured plot and the next year there was great improvement. To check the value of lime further, one plot was put on with just superphosphate and potash and the results were similar to those obtained with manure alone. Now I use one ton of hydrated lime, 500 pounds superphosphate and 200 pounds muriate of potash per acre as a starter. During the summer I manure this land. The cows will not eat the grass the year the land is manured. This is an advantage as it gives the bluegrass and white clover a good start. The second year it is so good that the cows do not get it eaten close to the ground.

"By taking as much acreage as I can handle in spare time each year I now have improved 30 acres of pasture. This improved pasture, on the basis of purchased feed which it replaces, is now worth $125 per acre. It has cost time and money to do this, but I am getting it back in reduced feed bills every year. I have felt that it was more profitable for me to improve what pasture I had rather than to buy or hire more 'rabbit' pasture and make the cows work every minute to get their feed. The only good thing about the original pasture was that it had good moisture conditions.

I notice that I do not get as good results on the dry parts of the pasture. I do not know how long the treatment will last but the first plot, started about seven years ago is still producing good feed. It has only had one treatment. Every morning the cows head right for this plot. They keep it mowed like a putting-green on a golf course."

Mr. Clark has 30 milking cows, 20 heifers, and 3 horses. He produces the winter roughage for these on 35 acres of crop land. He does this by growing corn for silage and by having a mixture of alfalfa and timothy for hay. Corn starts the rotation. The land is manured, limed as needed, and 500 pounds acid phosphate and 400 pounds muriate of potash per acre are used for fertilizer. The alfalfa-timothy mixture is seeded early in the corn, the corn being planted in hills spaced 3½ feet each way. This seeding mixture is used because a hay crop must be insured and this combination has never failed. Every acre of mowing is top-dressed with manure every year and produces a real hay crop.

Mr. Clark by top-dressing a rough pasture has reduced his summer feed costs to a minimum. By producing maximum crops of fine quality roughage on his crop land his milk check is not needed entirely to pay the grain bill. In fact an almost unbelievably small proportion of the milk check does this. His work is an example of what can be done on most northern dairy farms where a man has faith in good farming and the courage to back this up with action.

The Quebec Convention

(*From Page* 20)

lowing his opening speech, the Minister of Agriculture bestowed the Order of the Merite Agricole, the highest recognition that can be given to agricultural merit by the Province of Quebec, on four prominent members of the C. S. T. A.: the Hon. W. R. Motherwell, Minister of Agriculture of the Dominion, Dr. A. T. Charron, Dr. L. S. Klinck, and Dr. J. W. Robertson.

Toasts were drunk to "the King, our guests, the Province of Quebec, and Laval University." Speeches were made by the Hon. Mr. Motherwell; Mr. Archibald; Major H. G. L. Strange, President of the Canadian Seed Growers' Association; Dean Howes; Mr. Hector La Ferte, Speaker of the Provincial Legislative Assembly; Dr. Klinck; and Mgr. Camille Roy, Vice-Rector of Laval University and President of the Royal Society.

The Hon. L. A. Taschereau, Premier of the Province of Quebec, and many prominent personalities of the Province and the Dominion were in attendance at the banquet.

On Thursday, June 14, meetings of the various committees were followed by an evening boat trip on the St. Lawrence river. There was plenty of moonlight, singing, and dancing. The powerful voice and gesture of Mr. Georges Maheux inspired everybody and animated everything. Then, slowly, the boat came back to the harbor. The convention was ended.

During the convention Mr. Alphonse Desilets and Mr. Norris Hodgins undertook to publish a daily paper. "R U S," the result of their efforts, certainly was an enjoyable achievement.

The ladies and gentlemen of the various organizations, reception, entertainment, etc. committees, deserve the congratulations of all who attended the convention. But they did leave a hard task to those who will be in charge of the convention next year.

Inventors Who Work

(*From Page* 30)

not in a single case has the man who developed the invention claimed for himself one cent of profits, and in some instances his name is not even asociated with his device in the minds of the people it serves.

These are only a few of the many public service inventions that have been developed by Government workers, but probably in no other one small group, working on one set of problems, have there been so many inventions in so short a space of time. Other public service inventions relate to all kinds of crops and to all kinds of work. He who digs into these cases finds many striking evidences that the zeal for real public service constitutes in itself a genuine stimulus to invention. Most of these patents are the direct result of the recognition on the part of these scientific workers of certain definite needs in the industry. Their determination to meet these needs is so great that, when the means cannot be found, these men set out forthwith to create them. And they usually seem to succeed.

Supply and Demand

(*From Page* 21)

price of cotton is determined by the actual supply and demand relationship, rather than by what anybody says about that relationship.

Since 1910 the cotton market has experienced four serious price depressions. These occurred in 1911, 1914, 1921, and 1926. They were due in every case to large crops resulting from overplanting. In 1914 a record crop was harvested followed by a large crop. At the same time the demand for cotton was temporarily reduced by the outbreak of the war. Again in 1921 a combination of large production with restricted demand occurred. Thereafter prices rose. Acreage increased also, however, with the result that in 1926 a crop 5,000,000 bales greater than that of 1924 sold for $428,000,000 less.

There in broad outline you have the main facts of the way prices reacted to supply and demand conditions during the period in question. Statistical investigations made in the department trace the interaction of supply and price in minute detail. On the supply side monthly figures for the current actual supply of cotton and official estimates as to the prospective crop show the seller's position. Data giving cotton exported from and cotton consumed in the United States indicate the demand side of the equation. These data are coupled with information as to current and prospective changes in the business situation, with allowance made for the increasing growth of population and for the expanding use of cotton. With these data at their disposal statisticians figure out how the various factors influence cotton prices.

It is not necessary for our present purpose to go into the matter in any such detail. It will be sufficient to glance at some of the big things that have influenced prices in the last 10 or 15 years. Thus in 1911 recollections of good prices received the previous year caused farmers to increase their cotton acreage 11 per cent. This increase, with good yields, produced

4,000,000 bales in excess of the previous year's production. But though the crop was 4,000,000 bales larger, it was worth $130,000,000 less.

Let us look next at what happened after the war. In 1925 producers added 5,000,000 acres to their cotton acreage. They had a favorable season, and as a result the average farm price of cotton dropped from 22.9 to 19.6 cents a pound. This setback, however, was not sufficient warning. The following year, another million acres were added to the area in cotton with disastrous consequences. In the fall of 1926 cotton sold for around 12 cents a pound.

In 1927 the area in cotton was reduced 14.6 per cent. That was about half the reduction suggested as desirable by the Department of Agriculture. Its effect on prices was supplemented by the destruction of cotton in the Mississippi floods, and the market advanced materially. Nevertheless, still greater reduction in acreage would have been beneficial. It would have reduced the farmers' expenses of production and increased their net income.

It has been said, however, that cotton prices obey other influences than those of supply and demand for short, if not for long periods. This assertion is very plausible. Speculative buying and selling undoubtedly produces market fluctuations. But the evidence shows that speculative buying and selling reflect true supply and demand conditions more speedily than many suppose. When prices rise out of line with fundamental supply and demand conditions, they quickly fall. In like manner prices ruling lower than the natural supply and demand level are restored to that level as soon as the true facts become known. This is not a mere theoretical deduction from the law of supply and demand. It is a statistically proved fact. Price fluctuations above and below the supply and demand line are invariably of brief duration.

How uniformly the cotton market behaves under similar conditions is shown by its behavior in the three seasons beginning 1918, 1921, and 1927. Cotton prices rose and fell in these three seasons in a strikingly similar manner. This is particularly noteworthy because in the last season the Department of Agriculture, on September 15, 1927, issued a market forecast which has been held responsible for the subsequent course of prices. As no such forecast was issued in either of the two preceding seasons, the logical inference is that its effect in the 1927-28 season was negligible rather than important. In other words, the market acted in about the same way, in the year when the Department of Agriculture expressed an opinion in regard to price prospects, as it did in two similar years when no such opinion was expressed.

Law Unchanged

Each of these three seasons began with a large carryover of cotton from the preceding season. Each of them experienced the decline of about five per cent in general business activity. Each of them witnessed great speculative activity in the cotton market in August. And in each, prices later fell about as far and about as fast. In each year the break in prices followed *reduction* in the official crop estimate. Even the fluctuations which took place in these three seasons were similar.

It is evident that under like conditions the cotton movement behaves in a like manner. It is dominated not by anybody's view as to what it is going to do, but by the basic factors of supply and demand. These factors can be known in advance sufficiently to make possible very reliable general forecasts as to the course of prices. When the statistician knows the size of the American crop, the world carryover of American cotton, the general commodity or business situation, and the actual growth of the demand

for cotton due to increasing population and to increasing use of cotton, he can tell pretty confidently what the market will do.

In the last three or four years the Department of Agriculture has attempted this service for the farmer. It has achieved a high average of accuracy in its forecasts. Hereafter predictions as to cotton prices are to be banned. On other commodities the forecasting service is not to be changed. Accordingly farmers will still have an opportunity to see by actual test how far price analysis can claim status as an exact science. They will have an opportunity to use expert interpretations of economic data as a guide in planning their production. They will also have a practical continuing demonstration that the Department of Agriculture does not believe the law of supply and demand has been effectively repealed.

"Nothing But No. 1's"

(*From Page* 24)

The soil at Pecanway Place is Orangeburg sandy loam. Mr. Dantzler thinks that the best pecan soil is pebbly sandy soil, 8 to 10 inches deep with a white clay subsoil over red clay. He recommends clean cultivation to conserve moisture during droughts and keep down all growth so that the trees get all possible ventilation, which is a great factor in controlling scab. Continuous harrowing also helps the land to dry out thoroughly during wet weather.

Various cover crops have been tried at Pecanway, and the Austrian winter pea is now being used. The legume is planted in late September or early October, and turned under with fertilizers with a disc plow about six or eight inches deep in April when buds commence bursting. The soil is kept thoroughly cultivated throughout the summer with a disc harrow. This requires harrowing twice a month until the latter part of August. The cover crop is turned under in order to get the fertilizer and humus down to the roots of the trees so that during the summer the disc harrow will not disturb the roots when they come up to feed.

Mr. Dantzler's recommendations for fertilizing pecan trees are: From the third to the sixth year of growth, apply 10 pounds per tree of 7-6-5 fertilizer, increasing this 5 pounds per year until 25 pounds per tree is reached. After the sixth year start increasing the potash and phosphoric acid by putting down 30 pounds per tree of 12-8-10 fertilizer, increasing this each year by 5 or 10 pounds per tree until a maximum of 75 pounds per tree is reached. In the Pecanway orchard, the potash is increased after the twelfth year, using 70 pounds per tree of 12-10-15.

This fertilizer should be applied in a circle beginning 8 feet from the tree trunk and going 5 feet outside of the ends of the limbs. After the thirteenth year the fertilizer can be broadcast.

"In addition to our nut business, we sell a number of budded trees each year to people who are planning to start orchards," Mr. Dantzler said. "I always try to impress upon these buyers, the importance of giving their trees the proper care and treatment. There is a mistaken idea in some sections that pecan trees can be set out and forgotten and later discovered as a wonderful orchard. The important rule in pecan growing is *treat your trees well and they will be good to you!*"

Mississippi

(*From Page* 14)

formly over the field with side applications of potash varying from 50 up to 250 pounds of muriate of potash per acre;

Additional experiments to the ones named using various sources of potash in uniform amounts both on land where cotton has been grown continuously for three years and where it is being grown for the first time;

Varying the percentage of nitrogen in otherwise uniform mixtures, going from an 8-0-4 in 2 per cent increases to an 8-10-4.

Where experiments are being run primarily to test methods of wilt control at least a part of the land has been inoculated with wilt germs to insure the presence of this disease from the beginning of the experiment. None of this work is done in less than three replications, much of it in four, while check plots are placed at the beginning and end of each test and every fourth plot between.

In all, there are 359 plots on the Poplarville Branch Station utilized primarily in testing the effect of various soil treatments in the control of rust and wilt in cotton. Many of these have been under way for several years, many more were begun in 1928, and with favorable seasons some outstanding results this year or in the very near future should be obtained.

Vary the Analyses

At the Holly Springs Branch Station, C. T. Ames, director, has for a number of years run fertilizer tests on both valley and hill land common to that section of the state. He recommends the use of an 8-4-4 fertilizer on average soils, an 8-6-4 on soils deficient in vegetable matter, and an 8-4-6 or even an 8-4-8 on lands where rust affects cotton. Four hundred to one thousand pounds per acre are thought to be most profitable.

Mr. Ames is now conducting experiments with varying amounts of potash and phosphate. Some of the experiments have been run for three years while others have only been conducted for two years.

Graphs were issued at the end of 1927 showing the findings over three and two years. The average three-year tests on valley land at the Holly Springs Station with applications of an 8-4-8 gave a net profit $24.50; an 8-6-4, a net profit of $17.35; an 8-4-4, a net profit of $20.12; an 8-4-2, a net profit of $11.47; and an 8-4-0, a net profit of $5.20.

A three-year average on hill land at the same station, with nitrogen and phosphorus constant and potash used in varying amounts, shows the following results: An 8-4-8 gave a net profit of $34.15; an 8-4-6, $37.55; an 8-4-4, $36.94; an 8-4-2, $23.00; and an 8-4-0, $19.90.

On the cooperative experimental plots at New Albany that have been under way for two years an 8-4-8 netted $26.09; an 8-4-6, $21.87; an 8-4-4, $20.77; an 8-4-2, $15.63; and an 8-4-0, $14.98.

Averages over a three-year period on valley land with phosphate varying and nitrogen and potash remaining constant showed a profit of $20.12 for an 8-4-4; $16.27 for a 6-4-4; and $13.55 for a 4-4-4.

The same time average on hill land with the same fertilizer mixtures obtaining gave a net profit of $36.94 from an 8-4-4; $22.06, from an 6-4-4; and $18.56 from an 8-4-4. A two-year average at New Albany showed a profit of $20.77 from an 8-4-4; $15.20, from a 6-4-4; and $17.31, from the use of a 4-4-4 mixture.

Similar tests with nitrogen had not been completed at the station in 1927.

Valuable contributions to cotton production have been made by the station through its experiments in the spacing of cotton. It has been found to be practical and profitable to space cotton thickly. This is true, in most instances, regardless of variety or the different soil types found in the state. Farmers of the state have largely abandoned the old system of thin spacing after finding that yields are much larger where reasonably thick spacing is practiced.

Results on spacing tests at Holly Springs by Director Ames last year were very significant. On valley land, 5.03 plants per foot gave an acre yield of 1,588.7 pounds of seed cotton; 2.44 plants per foot gave a yield of 1,781.3 pounds of seed cotton per acre; 1.70 plants per foot gave an acre yield of 1,686.8 pounds seed cotton; .89 plants per foot gave an acre yield of 1,676.5 pounds seed cotton; .66 plants per foot gave a yield of 1,548.8 pounds seed cotton per acre; and .57 plants per foot gave a yield of 1,648.5 pounds per acre.

Thick spacing showed to a better advantage on hill land: 4.02 plants per foot gave a yield of 1,029.6 pounds seed cotton per acre; 2.43 plants per foot gave a yield of 1,020.6 pounds seed cotton per acre; 1.75 plants per foot gave a yield of 915.5 pounds per acre; 1.21 plants per foot yielded 904.7 pounds per acre; .71 plants per foot gave a yield of 823.5 pounds seed cotton per acre; and .63 plants per foot gave a yield of 764 pounds seed cotton per acre.

The Directors

The station also makes investigations in animal husbandry, plant pathology, horticulture, poultry, farm management, and farm machinery.

In addition to the work being done on the stations proper, something like 50 acres of experimental plots scattered over the state are under the direct supervision of station employees. This work is primarily with fertilizers and is designed to ascertain the plant food needs of the multiform soil types commonly found in the state.

Since the station was organized in 1888 five men have served as director. S. M. Tracy was the first director serving from 1888-1897. Other directors and their tenure of office were: W. L. Hutchinson, 1897-1910; J. W. Fox, 1910-1911; E. R. Lloyd, 1911-1919; and J. R. Ricks, present director, who succeeded to the directorship of all Mississippi stations in 1919.

The Poplarville (Old McNeill Station) Branch Station has only had one director, E. B. Ferris, serving in that capacity since its establishment in 1900. C. T. Ames has directed the work of the Holly Springs Station since it was established in 1904. There have been three directors of the Delta Branch Station at Stoneville: J. W. Fox, 1906-10; G. B. Walker, 1910-22; and W. E. Ayres, present director, who took charge in 1922.

Coordinate Work

Director J. R. Ricks, J. N. Lipscomb, Dean of the Agricultural School, and Director R. S. Wilson of the Extension Department, coordinate the experimental and instructional work in all phases of agriculture practised in the South and particularly in Mississippi, so that agricultural students upon completion of the regular four-year course will have a practical and scientific knowledge of agriculture.

The Extension Department with executive offices at the College unites with the College in disseminating the information obtained by the Experiment Station. Its organization of specialists and county agents, both men and women, effectively infuse the better methods of agriculture into the rural sections of the state.

The work of the station and the school of agriculture is correlated so that agricultural students get the benefit of all information obtained by the central and branch stations, even before it is issued in bulletin form. This is possible because most of the

central station employees are members of the instructional division of the College. The station farm is a part of the 2,270 acres comprising the college proper and is accessible to students and visitors desiring to observe the experiments from beginning until completion.

The Barberry Battle

(*From Page* 8)

ward the Swift county line. They continued their search into Swift county and found that the rust came from common barberry bushes seven miles away.

Not only can stem rust spread great distances from a barberry bush, but rust from a single barberry may cause excessive loss. W. E. Leer, Purdue University, told of a large 60-year old barberry bush which was found near Alert, in Decatur county, Indiana, back in 1922. It had already spread stem rust to grain fields of the community. More than 50 acres of wheat in the immediate vicinity of the bush were not even cut, and the grain from more than 200 acres in more distant fields was so badly shriveled that it was not saleable after being threshed. A prospective yield of 22 bushels per acre over an area of about 50 square miles was reduced to 8.8 bushels per acre. The total crop loss traceable to this single barberry bush amounted to at least $50,000 in that one season. This bush was destroyed in 1922. Observations made every year have revealed practically no stem rust losses in the community since the offending common barberry was killed.

Still another surprise awaited those in charge of the crusade against barberry. This came when efforts were made to kill the bushes. It was easy enough to kill them, but making them stay dead was a different thing. This really proved to be a big problem. When the work was first started bushes were dug with spade and mattock, or pulled out by the roots with horses and tractors. But the pesky rascals would not "stay put." Every little piece of root or root-stock left in the soil sprouted right away. Dozens of sprouts came up where one bush had stood before.

Then the eradicators turned to more modern methods of warfare—chemical. After a long hunt for chemicals which would kill bushes so completely that sprouts would not appear later, just two, common rock salt and kerosene, were found to do the business cheaply, surely, and safely. Now they have adopted the slogan "Kill It With Chemicals."

One gallon of kerosene poured around the roots is an average dosage. Ten to twenty pounds of crushed rock salt placed around the root crown, will kill an average size barberry bush. However, the action of kerosene is very slow. Barberry bushes growing close to valuable plants or trees are dug or pulled, as the application of chemicals may damage the other plants. Seedlings and small bushes sometimes are pulled, as it often is more economical to do this than to treat them chemically."

These are but a few of the surprises and problems which have come to light, but the campaign has continued with increasing vigor, the heat of battle ever growing fiercer. We still have stem rust, although not nearly so much. By delaying the early infection, barberry eradication has greatly reduced losses just as the scientists claimed it would do. The encounter against barberry and stem rust is far from won at the present time, but

more attention is being centered on the project than ever before.

During the past 12 years conservative estimates place the average yearly loss to all grains due to black stem rust at $54,000,000. The estimated loss of wheat alone in the six years, 1915 to 1920, inclusive, was about 50,000,000 bushels per year. This was before and during the early years of barberry eradication. During the six years from 1921 to 1926, when more and more barberries were being destroyed, the average loss dropped to about 16,000,000 bushels per year.

The Second Survey

There are 976 counties in the eradication area. With the exception of a very few, all of these counties have been covered on the first survey, which means a survey from house to house in towns and cities and from farmstead to farmstead in rural districts. This was conducted rapidly to get the largest number of bushes for the smallest amount of money and time expended and to eliminate as quickly as possible the greatest source of rust losses.

A second and more intensive survey is now in progress. The purpose of it is to scout every square yard of territory where there is a possibility of finding a barberry. In this way all straggling bushes missed on the first survey and all seedlings and sprouts which have sprung up recently will be found. Many years will be needed to complete this survey.

The common barberry is not a weed growing in the grain fields. It is a woody bush and may be found on lawns, in and around orchards, in pastures and woodlots, along fence rows, near streams, and in fact wherever bushes grow. Before eradication laws were passed, this shrub was commonly set out in hedges and in ornamental plantings around farm and city homes. It is an erect growing shrub which ranges in height from three to twelve feet. Extremely old bushes may grow to a height of almost 20 feet. When found in cultivated plantings, it resembles Spirea in general appearance. When growing wild in woodlands and pastures, it resembles wild gooseberry, common buckrush, prickly ash and other bushes, but a close inspection reveals characteristics which easily distinguish it from these and other bushes.

Foremost among its distinguishing characteristics are the leaves which are produced in clusters like apple leaves. The leaves may be either green or purple and have small spines on the edges, making them resemble a fine-toothed saw. Just below each cluster of leaves is a set of spines or thorns, usually three or five appearing from the same base.

Early in the spring, small yellow blossoms are produced but they are noticeable for only a very short time. In the fall, many small, red berries, oval in shape and hanging in clusters like currants, are noticed. The berries are numerous and hang on the bushes throughout the winter. When snow falls on the barberry bush in winter, the red berries make a beautiful sight. The outer bark of this bush is

Abandoned.

dark gray in color, while the inner bark and wood are bright yellow.

Common barberry should not be confused with Japanese barberry, which is used so extensively for shrubbery at the present time. Japanese barberry is a smaller, low-spreading bush which seldom reaches a height of more than four or five feet. It does not spread rust and should not be destroyed. It is easily distinguished by its small, smooth-edged leaves, single thorns, and berries hanging singly or in two's.

Some people think that, since the eradication campaign has been in progress for more than 10 years, all of the common barberry bushes have been found and destroyed. This is not the case, however, for thousands of bushes are being found at the present time.

Previous to this year, more than 4,000,000 bushes had been destroyed in the state of Wisconsin, yet within 10 days after field agents started work this spring they found 2,654 common barberries in Dane county, not far from Madison. Hundreds of bushes are being found in Hennepin county, Minnesota, along the shores of Lake Minnetonka. More than 1,100 bushes were discovered in Lake county, Indiana, during the month of June, and an entire carload of crushed rock salt was used to destroy the barberries found in the vicinity of Traverse City, Michigan, within two weeks after the work started in that state this spring.

Barberry eradication is progressing as rapidly as possible under existing conditions. It is a long and difficult task, but those who are in closest contact with the work are confident that it is possible to entirely eliminate destructive barberries from the 13 great grain growing states of our country.

Wheat Breeding

(*From Page* 26)

The selection method is based on the fact that many of our old standard varieties are not pure from a breeding standpoint, but are made up of various separate strains which differ greatly, not only in yielding ability, but also in many characteristics such as winter hardiness, disease resistance, and quality. The selection method consists of isolating these superior strains and increasing them from the original single head selected. This is not a very difficult matter but requires careful work over a long period of years, and the testing out of hundreds of selections.

The third and most fascinating method of wheat improvement is known as hybridization. In this method, hybrids or crosses between valuable varieties are made artificially and the resulting progeny are selected until they breed true and the most valuable ones are determined. Enormous possibilities are offered by this method because valuable characteristics of the various varieties can be combined into a new variety. For instance, we have many valuable wheats that are susceptible to disease, and, on the other hand, we have many wheats that are very resistant to the common diseases, but are inferior from the commercial standpoint. Combinations of these types of wheat have given us valuable commercial varieties that are, for instance, resistant to disease, or desirable in other characteristics that have been combined.

Without a doubt, the most notable wheat developed in this way is Marquis, the hard red spring wheat developed by Dr. Saunders in Canada. Dr. Gaines of the Washington Experiment Station has recently distributed to farmers two new wheats that were de-

veloped in this way. These wheats are known as Ridit and Albit. Both of them are good yielding wheats and resistant to the smut disease.

Concentrated efforts in many states by experimentalists on these three methods of developing superior wheats will surely give new and better varieties. If the progress made in the last decade continues, it is surely difficult to predict the performance of wheat varieties in 1950.

Sincerity

(*From Page* 4)

lot of truth to assimilate. We burrow in our own ant hills and depend upon the testimony of experts, who usually disagree at a critical time.

Grandma's "old time religion" is torn asunder by modernists and fundamentalists, by free-thinkers and neo-this-or-that. Grandpa's squirrel whisky has gone from a home remedy to a household liability, and there is as much "con" as "pro" about the inhibition business. The unswerving patriotism of my boyhood schooling has given way to Internationalism and pink colored cults. The red schoolhouse rule of three is on a side-track while the teacher gives the chart class lessons in expression eugenics, and social control. Web perfecting presses by thousands, radio sets, and nonstop lecture tours dull our once keen minds by the friction of fiction and fact. Our job now is to find which is which and what for. No age has had so many facts to digest and so many directions to face at the same time.

Therefore, we are prone to be doubtful of many things. When one is in doubt and the mind is not made up, how can one find it easy to be sincere? Sincerity of opinion requires conviction.

I have made so many mental reservations that my brain must look like a wild-life refuge. I've had to pigeonhole my data on Bernard Shaw, Mexico, Tunney's abdication, and Al Smith's temperance platform, and I have still neglected to file and catalogue my gist of references on oceanic flights, the public utility conspiracy, the European war debt, and the conclusions of the soil improvement committee. Have patience! I shall in due time get ready to form an opinion on something, and perhaps I can be sincere about it until the next load of mail arrives. Only a tireless student or a victim of insomnia can hope to be sincere in an opinion worth fighting for these days. The average man can't stay awake long enough.

Now I come to another interesting phase of sincerity. Many people are sincere in opinions and beliefs that are *not* based on facts. The sincerity of a child waiting for Santa Claus is matched by the sincerity of some farmers in the relation of plant growth to the moon's changes or belief in permanent relief through legislation.

This kind of sincerity may be called naive. In children who talk of the Sandman and St. Nicholas we see nothing but winsome delight. In the old-fashioned farmer who sticks to the opinions of past generations we see nothing but stubborn resistance. It's all in the point of view.

Wordsworth says that all the world lies close about us in our infancy. Who is there who has not tried to prolong the period of a child's innocence to dwell in those charming days of fairy tales and Christmas reindeer? Who has not regretted the exchange of childhood's disinterested sincerity for the sophistication of adolescence and the trying teens?

I am aware that this is the wrong

dope. The child psychologists would be vexed at this, terribly. They do not believe nowadays in playing hocus-pocus with the babies. The whole truth and nothing else but!

For my own part in this I trust to infantile impressions gained when I was abundantly sincere and believed that all men were likewise. I recall that I ardently loved and revered an old music master of our village who used to stop and watch me at play. After I had reached the age when I could be trusted with the truth, I learned he was called one of the meanest old codgers in our bailiwick. Maybe if he had sensed how highly I regarded him, he might have turned a new leaf in his book of life. Even yet his face haunts me as benign as the pictures of John Burroughs, and I wonder sometimes if they ever gave him a chance to be as sincere as I thought him to be.

EMERSON says that to believe in yourself and what you hold to be true is genius. Matthew Arnold links culture with sincerity of knowledge and refinement. I am aware that culture and genius taken hold of in those terms are as hard to find as a dry prohibition officer. Yet I am sincere in hoping to cultivate a share of it, and so are you.

Every man worth consideration is trying to be cultured and thinks he is a genius. He nurses his ego in all sincerity, but when he gets to exhibiting too many blue-prints of his own model of a perfect self-made man, watch out for trouble!

Men who hold to that kind of lonely, self-absorbed sincerity are so bothered with the details of their own perfection that they miss the real brand of sincerity. This I hold above all others to be *sincerity* of *service*.

But don't quit on me yet! I am not taking you from this point directly into a salesmen's pep convention or to a Rotary luncheon. By using the term "sincerity of service" I am only taking you from the passive to the active form of sincerity. Before this I have mentioned sincerity of opinions, beliefs, and moral attitudes. Now I am drawing toward the grand finale, which consists in taking sincerity completely out of the dusty dictionary and putting it out at hard day-labor.

When sincerity is used in the industrial or professional world, it pays big dividends. The old vikings of the commercial seas were often piratical and sailed under false colors until they gained a tricky victory, whereupon the skull and cross-bones were flung to the breeze.

TRUTH-IN-ADVERTISING, ethical training, and progressive business associations may have had the first opportunity to point the way, but sincerity sold itself to anyone who gave it a fair trial.

Codes of ethics have been almost as generally adopted as trade-marks. Cynics may sneer as they will at what they call hypocrisy in business, but I have found in dealing with large corporations that they hardly dare to do otherwise than live up to their contract with the public. The high standard of living has made a more discriminating public, while the dissemination of technical information has made it harder for the charlatan to make a profit out of deceit.

Of course, insincerity will continue to be bootlegged as long as humanity is in its present imperfect state, but the genuine article forever gets all the repeat orders. The investment banker is vigorous in closing the market to the hawker of false securities, because every empty oil well is a drag on legitimate gushers. The bar associations frown on the shyster and sooner or later knock down his greasy shingle. The medical faculty is zealous to ban the quack. The ministry unfrocks the preacher who hides hideous sins

under a cloak of apparent sincerity. The advertising profession is a dynamic advocate of fair dealing and honest service.

It all finds a common root in confidence. Where man reposes confidence, he banks his greatest treasures, and the failure of an institution to be worthy of confidence is the greatest calamity that can befall it.

SINCERITY is no longer a crutch for weak sissies to lean upon and for strong men to disregard. Sincerity is a powerful weapon in the arsenal of competition. Industry and profession bid against others in their lines for a larger share of public confidence and patronage. Community vies with community and city with city, each looking for a larger chance to earn the wages of sincerity.

Mergers which have recently taken place in such large numbers were the result of the necessity for minimizing ruinous and insincere competition.

An old-time business often plumed itself over the dishonesty of a competitor and reckoned on getting the increased trade resulting from the doctrine of "caveat emptor,"—let the buyer beware.

It's different now. Manufacturers and sales agencies unite to advertise their common product and to teach the weaker ones how to establish a universal confidence in all goods and services they sell.

"Say it with flowers"—"save the surface and you save all"—"wood; use it; nature renews it," these are not mere empty catch words to make readable copy for the advertising field. These and similar national campaigns have sent a far-reaching force down the line of their endeavor to make such slogans stand for sincerity.

Mankind in the mass may not be as pious as of old. There are not so many camp-meetings. But I can well remember folks who snuffled on the mourners' bench and then laid awake nights figuring a way to cheat someone out of the nickel they put in the plate. When Big Business got "converted," it crowded all those sniveling hypocrites off the mourners' bench and then proceeded to make ethics work. Business sincerity has managed to spread a little more of the Sunday spirit through the rest of the six days.

I am confident that as time goes on our stock of every-day sincerity is going to become more automatic and we shall be less self-conscious about living the truth. The machinery creaks a little nowadays in bearing the load of responsibility and sincerity forced upon us by the higher standard of ethics that *almost* keeps pace with the higher standard of living.

It would be as easy, no doubt, to be sincerely cynical as to be sincerely hopeful and confident about the future. But if I am going to be sincere about anything, which requires a vast amount of energy, I shall be so for the sake of *ideals* rather than unworthy *suspicions.*

AND finally, you must concede that sincerity, to be genuine in its work, must not be too conspicuous or bear a label.

It must be quietly and unobtrusively on the job, like mother in the kitchen.

The rough and jocular sincerity of two laborers in the ditch or two dough-boys in the trenches, the honesty of purpose which responds alike to the pipes of Pan or the factory whistle—that's the brand I intend to emulate and acquire a share of if I may.

There is a prouder pen than Jeff's to clinch this argument for once and all. I leave you to ponder the lines of Henry David Thoreau:

"Between whom there is *hearty truth* there is love; and in proportion to our truthfulness and confidence in one another our lives are divine and miraculous, and answer to our ideal."

IF IN DOUBT

Judge—"And why didn't you stop beating the plaintiff here when he had yelled 'enough' three or four times?"

Defendant—"Well, you-all don't know how dat man can lie. You can't nevah believe him."

An American was prowling around a Scottish churchyard. His eyes caught the epitaph "Lord, she was thin."

"Say, sexton, what d'ye make of that?" he asked.

"That's all right, sir; the sculptor went over near the edge of the stone and didna leave room for the 'e'."

Seth's pap sent him to the mill one day to try to sell the season's wheat crop.

Seth got hold of the miller and submitted a handful of wheat to him. The miller examined the wheat very carefully. Then he said:

"How much more has your pap got like this?"

"He ain't got no more like it," young Seth answered. "It took him all morning to pick that out."

"Pa, what does it mean here by 'diplomatic phraseology'?"

"My son, if you tell a girl that time stands still while you gaze into her eyes, that's diplomacy. But if you tell her that her face would stop a clock, you're in for it."—*Union Pacific Magazine.*

A SATISFACTORY ANSWER

At a baseball game a young woman asked her escort: "Why does that man behind the hitter wear such a big bib?" He explained to her that it was to keep the catcher's shirt from getting all mussed up when the ball knocked his teeth out.

"Why did you break your engagement with that school teacher?"

"I didn't show up one night, and she wanted me to bring a written excuse signed by my mother."—C. C., *N. Y. Mercury.*

ELECTION UNANIMOUS

Asked at the marriage license bureau where his bride-elect" was, a negro replied sharply: "What yo' all mean, bride-elect? Dey weren't no election; de lady appoint herself to de office at mah own pussonel request."

Hubby: "Why are you angry with the doctor?"

Wifey: "Just think! When I told him I was awfully tired he asked to look at my tongue! Think of it, my tongue!"

POPULATION CONTROL

Owing to the lack of space and the rush of editing this issue, several births and deaths will be postponed until next week.—*Announcement in an Iowa paper.*

Green and Growing

THIS cotton on the farm of Cokers Pedigreed Seed Co. of Hartsville, S. C., has been fertilized for three years with 700 lbs. of 10-3-3 and top-dressed with 200 lbs. of nitrate of soda and 300 lbs. of kainit.

The three rows in the foreground have had their leaves picked off to show how much open cotton is on the stalks throughout the entire field. In spite of the fact that the stalks are fast maturing fruit they are still green and growing, and have not shed their leaves.

Potash top-dressed cotton stays on the job. It remains green until late in the season, holds its fruit longer, and withstands dry weather better. It is easier to pick and has a better ratio of lint to seed.

Agricultural and Scientific Bureau

N. V. POTASH EXPORT MY.

of Amsterdam, Holland

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